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Big guns collaborate on computer telephony

BY DAVID ROHDE

New York

Four industry giants — AT&T, IBM, Apple Computer, Inc. and Siemens Rolm Communications, Inc. — this week will announce they are collaborating to speed development of standards for integrating computer and telephone equipment.

But industry observers expressed concern that the new consortium might actually slow down such convergence because its work competes with initiatives led by Microsoft Corp. and Intel Corp. That could freeze applications work by independent developers that is sorely needed to make computer-telephone integration (CTI) a widespread reality.

Although details are sketchy, a number of efforts that have been discussed among the vendors as long ago as mid-1993 are likely to be unveiled at the announcement here, according to Jim Burton, president of C-T Link, Inc., a Boston consulting firm for vendors in the CTI arena.

For example, the companies have been discussing a videoconferencing bridge that would work across

See Collaborate, page 75

Computer-telephone face-off

Members of the new consortium backing Apple's Geoport computer-telephone interface:

- **Apple**
- **AT&T**
- **IBM**
- **Siemens Rolm Communications**

Developers of the rival serial bus interface:

- **Compaq**
- **Intel**
- **Microsoft**
- **Northern Telecom**

ATM makes slow but steady progress

BY THOMAS NOLLE

In the three months since we put a stake in the ground with the premier ATM Interoperability Report, we've seen some encouraging progress in several important areas of ATM product and service compatibility.

There has been some movement, for example, in switch and carrier interworking standards, which define how Asynchronous Transfer Mode services from different carriers will work together and how ATM services will interoperate with other types of network services, such as frame relay.

There is also some good news in adaptation layer standards, which cover the conversion of traditional data types, such as frames, into ATM cells, and in signaling, which is the glue binding devices together in ATM nets or mixed networks of ATM and non-ATM gear.

Schedules set this summer for the advancement of ATM interoperability are being met, as the following area-by-area report shows. That means the ATM Forum is on track to release in 1995 key specification documents, which drive compatible product implementations.

While much of the progress in ATM interoperability was expected,

See ATM Report, page 10

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003

NetWare to cruise the Internet

Novell offerings will help companies do business on the 'Net.

BY KEVIN FOGARTY

San Jose, Calif.

Novell, Inc. is readying products to help businesses set up shop on the Internet and give NetWare clients easy access to 'Net resources.

Included is a kit for building World Wide Web Home Pages, an add-on module to give NetWare clients TCP/IP access to Internet services, navigation tools such as news readers and support for Internet-related E-mail protocols.

The products are part of a package meant to complement Corsair, a planned NetWare client/World-Wide Web browser, said Lou Leporace, product marketing manager for Novell.

All the products will be available late next year, except for Corsair, which will probably ship in May, he said.

The package of easy-to-use Internet access tools should help Novell catch the groundswell of interest in the 'Net, said Norton Greenfeld, president of Wayland, Mass.-based consultancy Implements, Inc.

However, competing products from Microsoft Corp. and others will begin appearing about the middle of next year, meaning Novell had best meet its target ship dates or risk missing its opportunity, he said.

"People need that kind of Internet supplementation and single-vendor support," Greenfeld said. "Late '95 is late, though."

BUILDING A HOME

At least users will have time to think about how to employ such tools as the Home Page kit, designed to help users build a graphical front end to data they want to make available for customers, business partners or employ-

See NetWare, page 75

More about the Internet

MCI launches 'Net access and on-line service.

UUNET spins turnkey Web service.

See page 6.

RDBMS giants readying data warehouses

BY BARB COLE

Emeryville, Calif.

Looking to leverage their success in production databases, Informix Software, Inc. and Sybase, Inc. are separately getting ready to invade the market for client/server-based data warehouses.

Data warehouses, which are used to store data snapshots taken from production databases, are gaining favor as a way to share critical corporate data with desktop users.

Until recently, most data warehouses were built with specialized databases, such as Red Brick Systems, Inc.'s Red Brick Warehouse. But relational database companies have begun targeting this fast-growing market, seeking to meet user demand for consolidated database systems.

"This is good news for us because right now we use Sybase databases, but our data warehouse is in [AT&T Global Information Solutions] Teradata. In the long term, this would mean a single platform," explained Judy Newdom, senior vice president of information systems at Bradlees, Inc., a Braintree, Mass.-based department store chain.

"It's a no-brainer that relational database companies have to participate in the data warehousing market," said Bob Moran, an analyst at Aberdeen Group, Inc. in Boston. "[The market is] about to explode."

See Warehouses, page 76

USER PROFILE

Microsoft finds a new route to service

BY DAVID ROHDE

Redmond, Wash.

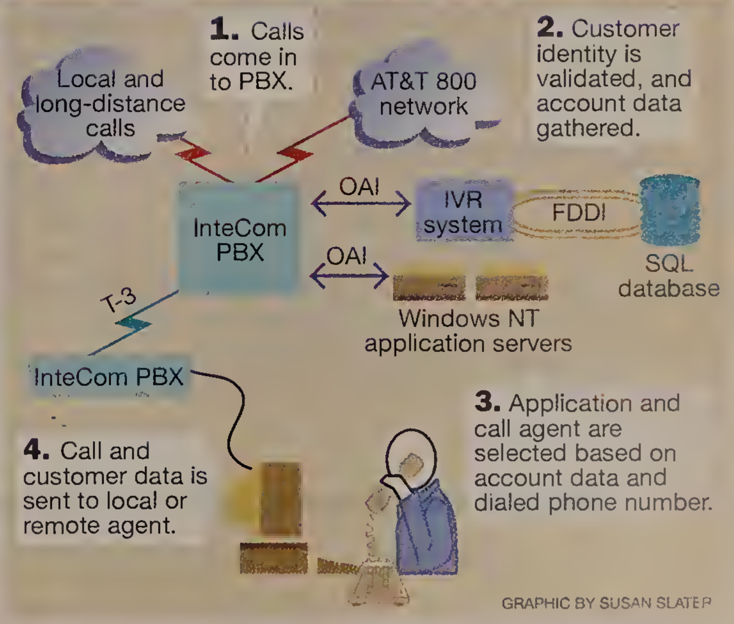
Garry Myall is standing call center technology on its head.

Myall, director of client services for the product sales and support operation at Microsoft Corp., needed a system that could route calls to more than 7,000 agents around the country based on what the customer was calling about, not on where the agent was located.

AT&T provides such an intelligent routing service, but it costs tens of thousands of dollars per month, plus extra per-call charges. So Myall decided to do it himself by building a T-3 network connecting private branch ex-

See Microsoft, page 75

Microsoft support division tackles call routing


Local and long-distance calls
1. Calls come in to PBX.
AT&T 800 network
2. Customer identity is validated, and account data gathered.
InteCom PBX
OAI
IVR system
FDDI
SQL database
OAI
Windows NT application servers
T-3
InteCom PBX
3. Application and call agent are selected based on account data and dialed phone number.
4. Call and customer data is sent to local or remote agent.

GRAPHIC BY SUSAN SLATER

Briefs

Just say X.400/X.500. Logicon, Inc. last week won a Defense Department contract to oversee construction of a secure national X.400/X.500 messaging network aimed at linking law enforcement officials across the country in their fight against drugs. Logicon will rely on X.400 messaging software and X.500 directories from Enterprise Solutions, Ltd.

Unimanagement. Computer Associates International, Inc. last week enhanced its CA-Unicenter systems management platform with software distribution capabilities, and agent software for managing distributed databases and operating systems. All of the technology was acquired from ICL. CA-Unicenter/Software Delivery costs $3,900 per 100 desktops; CA-Unicenter DB Alert starts at $500; and CA-Unicenter/Systems Alert costs $2,500 for 100 Windows desktops and $250 per non-Windows desktop. All products are available now.

CA: (516) 342-5224.

Some broad support. A host of key network vendors aligned last week with chip vendor PMC-Sierra, Inc. in a joint submission to the ATM Forum for a 25M bit/sec Asynchronous Transfer Mode specification. Cabletron Systems, Inc., Cisco Systems, Inc., Fore Systems, Inc., BNR, Inc., Cascade Communications, Inc. and DSC Corp. all backed PMC-Sierra's Uni-Phy-25 proposal.

It is based on the forum's fractional Synchronous Optical Network (SONET) framing technology and supports transmission of ATM cells over Category-3 twisted-pair wiring. PCM-Sierra proposed the alternative after IBM announced plans to resubmit to the ATM Forum its previously rejected 25M bit/sec proposal.

VIM and vigor. Lotus Development Corp. is reaffirming support for its Vendor Independent Messaging (VIM) application program interface. In a message posted on the CompuServe network, the company said it will release a new VIM developer's tool kit in the first quarter of next year and plans to support VIM at least through the end of the decade. The next version of Notes, however, will also gain support for Microsoft Corp.'s Messaging API.

NOORDA

Changing of the guard. Ray Noorda last week gave up his last official post at Novell, Inc., retiring from the company's board of directors — which gained two new members: former WordPerfect Corp. cochairmen Alan Ashton and Bruce Bastian.

The domain game. The number of commercial domains on the Internet reached 24,762 in November, a 13.7% increase over the previous month, according to Mike Walsh, who tracks the statistics.

Among the newest entries are the National Hockey League (nhl.com) and Harley-Davidson (hog.com). Coca-Cola, Inc. also came on-line, with coca-cola.comand cocacola.com — coke.com had already been taken by a California college student.

It's Time for cellular. Time-Warner Telecommunications, a division of Time-Warner Entertainment Co., last week launched its first cellular service, picking Rochester, N.Y., as the inaugural site. Dennis Patrick, former Federal Communications Commission chairman and now president and chief executive officer of Time-Warner Telecommunications, said the company planned to bundle cable, wireless and wire line services in the future for customers.

Busy Microsoft lawyers. Microsoft Corp. and Intuit, Inc. said they are cooperating with the U.S. Justice Department's request last week for more information in its antitrust review of their $1.5 billion deal, announced last month. Microsoft wants to acquire the maker of the personal finance package Quicken and plans to head off monopoly complaints by giving its competitive product, Money, to Novell, Inc.

Microsoft foresees the Intuit acquisition as a key cog in its electronic commerce strategy.

For details on how to reach us, see page 78.

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Buyer's Guide

T-1/T-3 mux makers extend the life of current models with support for ATM, SONET and direct LAN connections, but few vendors overhaul their boxes for the long haul.

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Network HELP desk

Network World *tracks down answers to your questions regarding products, services, technologies or disputes with vendors. Please submit questions to Alison Conliffe at (800) 622-1108, via fax at (508) 820-1103 or (508) 820-3467, via the Internet at aconliff@world.std.com or via CompuServe at 75471,2725.*

Six months ago, I installed an evaluation copy of Cheyenne Communications, Inc.'s FAXserve for a 30-day live trial of the product. After the trial period, I proceeded to delete the program from my file server but found that the main FAXserve directory, a subdirectory and two files could not be deleted.

I've contacted Cheyenne's technical support department, but they cannot come up with a reasonable solution for removing these files. I've also made numerous calls to other company representatives, but to no avail. I am still unable to remove the files, and this is unacceptable. Can you help?

Barry Boltz, Portland, Ore.

NW contacted Denise Behringer, director of marketing communications at Cheyenne, to help resolve the problem. Several days later, Yuda Doron, chief executive officer of Cheyenne, contacted Boltz with his apologies and promised to get the problem resolved. Sure enough, that same day a Cheyenne engineer contacted Boltz and provided information about how to obtain a utility from Cheyenne's bulletin board system that would enable him to delete the files. Boltz downloaded the utility and successfully used it to remove the FAXserve files from his file server.

Our company owns copies of Woodside Technologies, Inc.'s Fortress security software for Unix. I was surprised to recently learn that the technical support phone number given in the Fortress user manual is no longer in service and is without a forwarding number. Do you know how I can contact the company?

David Sulser via the Internet

NW found that Woodside Technologies was purchased by Los Altos Technologies, Inc., the original developers of Fortress. They will handle Fortress sales and continue to provide technical support for licensed users.

For more information, you can contact Los Altos

See Help desk, *page 58*

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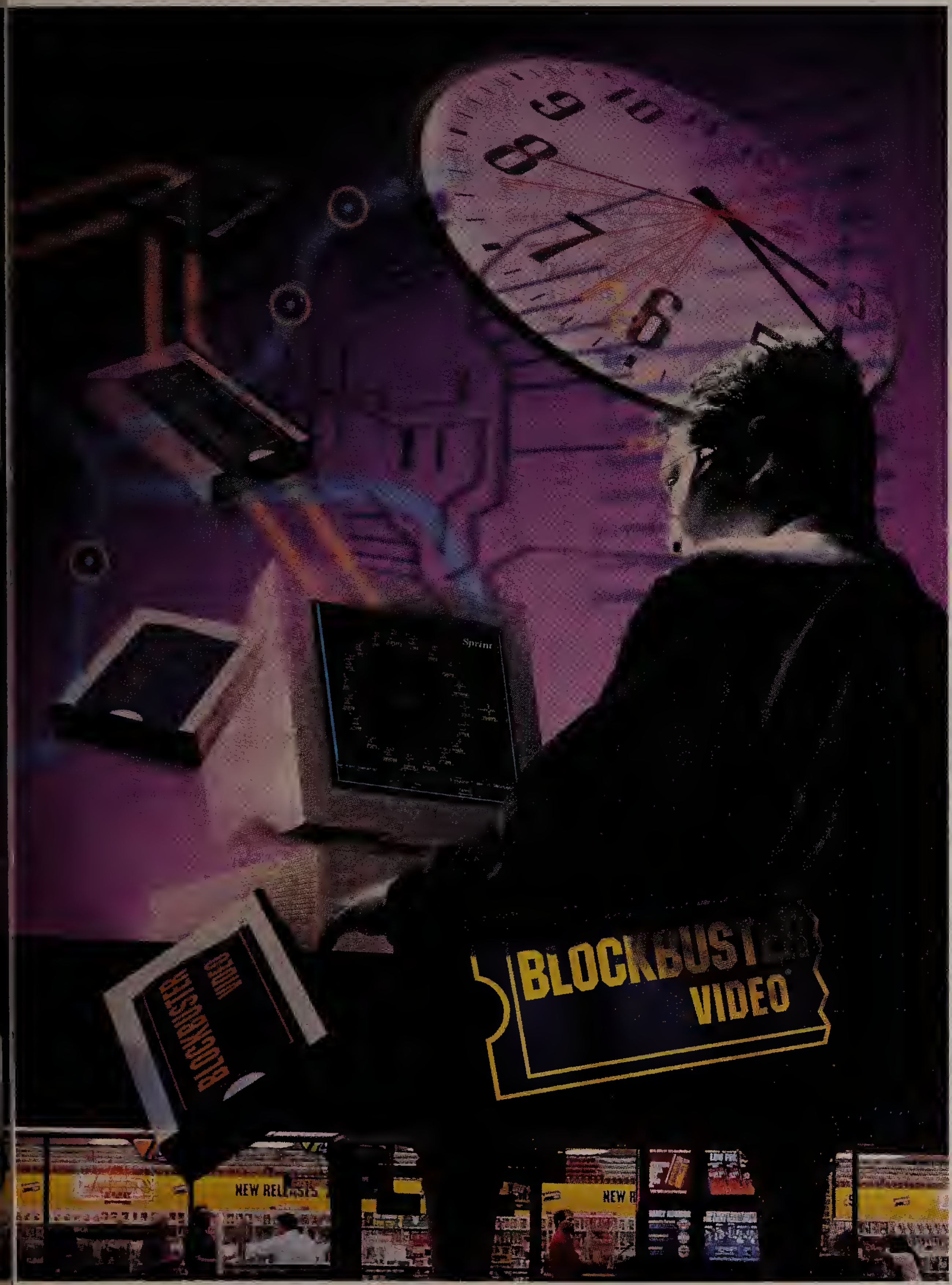

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CrossComm clears path for switched internet blueprint

BY JIM DUFFY

Marlborough, Mass.

CrossComm Corp. this week will disclose its strategy for migrating users of shared-media LANs to switched infrastructures when it announces its ClearPath architecture and supporting products.

ClearPath is designed to leverage the Asynchronous Transfer Mode cross-point switching matrix in CrossComm's XL router chassis. Currently, XL routing modules are interconnected via a 128M bit/sec packet bus. Next-generation modules will attach directly to the 9.6G bit/sec switching matrix.

The strategy calls for developing new routing, switching, LAN emulation and virtual networking modules for these platforms to allow users to incrementally migrate to ATM without discarding existing equipment. CrossComm is working with a number of partners in this effort, including General DataComm Industries, Inc. (*NW*, Oct. 3, page 14).

Switching "is a strategic move for us," said CrossComm user Randy Johnson, director of data communications at Premier Bank, N.A. in Baton Rouge, La. "Banking is headed toward imaging and high-bandwidth applications. We're waiting patiently for the local carriers to give us ATM."

CrossComm will roll out ClearPath in stages. In the first quarter of 1995, the company will introduce routing modules for its high-end XL 80 that perform ATM cell segmentation and reassembly. The company will also unveil workgroup Ethernet LAN switching modules for the lower end XL 10 and XL 20 that provide dedicated Ethernet bandwidth to desktops.

The new routing module, called XLT, will support four LAN interfaces each and provide a collapsed ATM backbone for LAN internetworks.

The workgroup Ethernet switching module, called the ESM-14/2, will sport 16 ports, 14 of which will provide 10M bit/sec bandwidth to desktops and servers. The other two ports will support either 10M or 100M bit/sec speeds.

The second stage, scheduled for the second quarter of 1995, will see the introduction of ATM interfaces for the XL 80 that support speeds up to 155M bit/sec, and LAN segment switching modules for the XL 10 and XL 20.

The ATM interfaces will provide a way to link hubs to ATM switches for campus backbone applications, while the 16-port segment switch — called the EBM-16 — will support high-performance switched backbones for shared-media hubs and routers.

Planned for introduction in Stage 3 are ATM switching engines and LAN-emulation modules for the XL 80, and ATM interfaces for the XL 10 and XL 20 that will connect those devices to the XL 80's ATM switching engine at up to 155M bit/sec. This phase, slated for the fourth quarter of 1995, will provide for high-speed, ATM-based LAN workgroup and segment switching that converts LAN media access control addresses to ATM addresses, and vice versa.

CrossComm's game plan

LAN switching	Date	ATM support
Dedicated workgroup switching modules for XL 10 and XL 20.	1Q 1995	XL 80 router modules for ATM cell segmentation and reassembly.
LAN segment switching modules for XL 10 and XL 20.	2Q 1995	ATM interfaces for XL 80.
LAN switching to ATM using XL 80's 9.6G bit/sec cross-point matrix switch backplane.	4Q 1995	ATM switching engines for XL 80.
	1996	

Virtual LAN internetworking using Protocol Independent Routing and Address Processor and Directory.

The last phase of the ClearPath strategy will result in virtual LAN services for the XL product line. Those services include addressing and directory capabilities for multiprotocol devices, policy and administration services, and routing between virtual networks.

Virtual LAN capabilities will be available in 1996, said Nigel Machin, general manager of CrossComm's High-Speed Networking Division.

On the competitive front, ClearPath contrasts starkly with the ATM migration strategies of Cisco Systems, Inc., Bay Networks, Inc. and 3Com Corp. ClearPath is based on a common hardware architecture and common interface modules.

The other three pull together multiple stand-alone, yet dissimilar, boxes and interfaces.

But analysts say ClearPath's common platform may be the architecture's only benefit. CrossComm may have trouble matching the cost-efficiencies of its competitors.

"CrossComm has a very attractive message vis-a-vis these other competitors because they're putting everything in a single box," said John Morency, principal of Strategic Networks Consulting, Inc. in Rockland, Mass. "The disadvantages of that approach is that I don't think you'll necessarily get the economies of scale to compete on a price-per-port basis equally across shared LANs, ATM switches, router ports, etc."

But Machin claims that ClearPath will provide a more cost-effective migration path to ATM than Cisco's CiscoFusion. CiscoFusion, he estimates, will cost users $87,000 to purchase workgroup and departmental ATM switches, as well as upgrade a Cisco 7000 router with ATM interfaces and processors.

CrossComm will not disclose pricing for the ClearPath products until they are ready to ship.

✆CrossComm: (508) 481-4060.

Novell to cut NetWare prices; AT&T to bundle UnixWare

BY KEVIN FOGARTY

Novell, Inc. is trying to build a constituency for its UnixWare and NetWare 4.X products by cutting NetWare prices and expanding the cadre of server providers offering UnixWare with their machines.

Novell and AT&T Global Information Solutions (GIS) will announce in January that AT&T GIS will bundle UnixWare with its line of servers, from its high-end massively parallel processing servers to its low-end Globalyst line of Intel Corp. Pentium single-processor servers, according to sources within AT&T GIS.

Because UnixWare is positioned as an application server with close ties to NetWare, the bundle promises to make AT&T GIS servers more attractive to a large installed base of LAN users. It will also give Novell its first high-end, systems partner, said Brad Day, analyst at Dataquest, Inc. in Framingham, Mass.

Novell has a similar deal with Compaq Computer Corp., but it has lacked a partner among high-end systems vendors such as AT&T GIS, Hewlett-Packard Co. and Sun Microsystems, Inc. Each of the three hardware makers, which vie for the title of top Unix systems vendor, has focused on its own flavor of Unix.

AT&T GIS' plan is to offer both Windows NT and UnixWare as primary options on its servers, the source said. AT&T GIS will de-emphasize its own Unix flavor as well as that of The Santa Cruz Operation, Inc. in favor of UnixWare.

The agreement has not yet been finalized, according to the AT&T GIS source, but Novell's UnixWare Systems Group is already gearing up for the announcement and marketing push that will follow.

AT&T GIS and Novell officials declined comment.

The good news for UnixWare is that the choice of what application server operating system to buy has become a two-horse race, with Windows NT and UnixWare in the front, and Unix flavors from other vendors trailing, said Larry Lytle, president and chief executive officer of the UnixWare Technology Group, a consortium of vendors supporting UnixWare.

AT&T GIS is being cautious in its backing of UnixWare, said Scott Winkler, analyst at the Gartner Group, Inc. consultancy in Stamford, Conn. AT&T GIS wants UnixWare to be successful, but the company is hedging its bets by also bundling Windows NT.

Novell has also revamped its NetWare pricing to make it more flexible and has plans to drop the price of NetWare 4.X to match that of NetWare 3.X.

It now sells for about 25% more than 3.X.

The new scheme is designed to bring NetWare pricing closer to that offered by Microsoft and Banyan Systems, Inc., both of which have announced user-based pricing recently.

Novell will continue to sell licenses in packs of five, 10, 25, 50, 100, 250, 500 and 1,000, but it will let organizations run a combination of licenses on a server, rather than running only one license package per server, as before.

That will allow customers to more closely match licenses to the number of users they need to support.

For example, a company with 275 concurrent users now has to buy a 500-user license pack. Under the new plan, that company can combine a 250-user pack with a 25-user pack.

The plan will let companies add users in increments of five, letting them grow their networks slowly, said Mike Rothman, analyst with the Meta Group, Inc. consultancy in Reston, Va.

Staff writer Margaret Dornbush contributed to this report.

Migration strategy

NetWare 4.1, when released in December, will include a tool to convert NetWare 3.X binderies to NDS on-line. Novell will also offer free for a limited time ND Standard, a tool from Preferred Systems that makes the conversions off-line.

CORRECTIONS

The recent Buyer's Guide chart on desktop videoconferencing (Oct. 31, page 54) omitted the fact that InSoft, Inc.'s Communique supports multipoint conferencing.

Philip Lozowick's letter to the editor "In defense of fast Ethernet" (Nov. 14, page 62) should have stated that some fast Ethernet adapter cards are being introduced for less than $300.

INTERNETWORKING

UB set to deliver feeder switches

BY JIM DUFFY

Santa Clara, Calif.

UB Networks, Inc. next week will unveil an Ethernet LAN switch equipped with a high-speed Asyncronous Transfer Mode uplink port but still priced like a workgroup switch.

The GeoRim/E is unique in that it matches the performance of the fastest backbone class LAN switches, but comes in at about one-third the price at roughly $500 per port, according to sources briefed by UB.

The chassis-based store-and-forward switch features a 1.2G bit/sec backplane and supports as many as 12 single-port 10M bit/sec Ethernet modules. The modules support either 10Base-T unshielded twisted-pair, fiber or coaxial cable.

Rather than buying 12 separate modules, users also have the option of purchasing one 12-port module, but the switch maxes out at 12 LANs, sources said.

A UB spokeswoman declined to comment on the product introduction.

SUPPORT FOR FDDI PORT

In addition to a 155M bit/sec ATM interface, the GeoRim/E supports a dual attach, multimode Fiber Distributed Data Interface port or a 100M bit/sec fast Ethernet port. The switch will also include routing software, which will allow users to configure GeoRim/E as a remote access router, sources said.

The GeoRim/E provides dedicated 10M bit/sec pipes to shared-media hubs, which

See UB, *page 8*

TCP/IP Applications For Windows.

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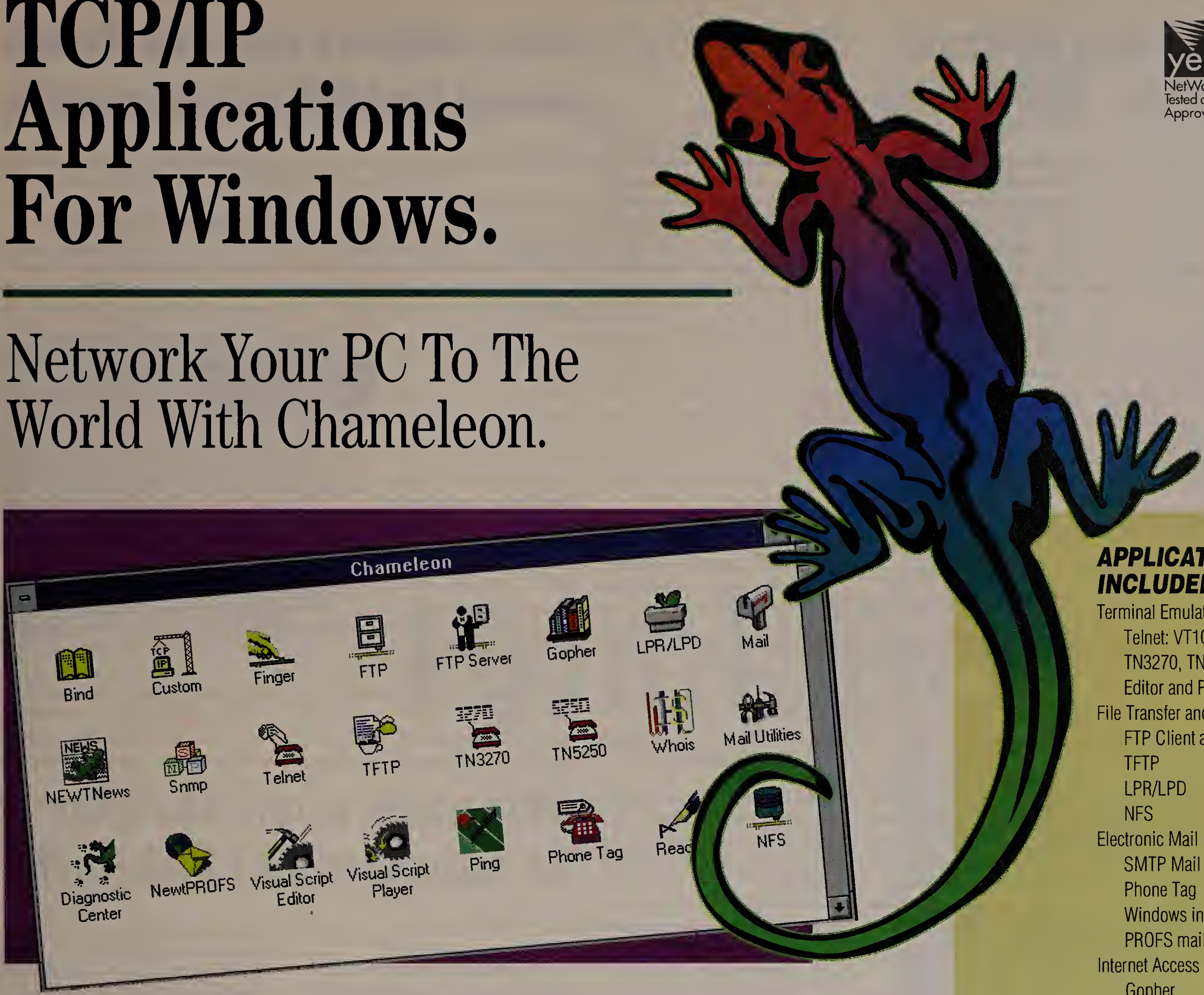

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  - NFS
- Electronic Mail
  - SMTP Mail with Mime
  - Phone Tag
  - Windows interface to IBM PROFS mail
- Internet Access
  - Gopher
  - Newsreader
  - WhoIs
- Network Utilities
  - Ping
  - Finger
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- Networking Tools
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MCI wades into Internet access and on-line arenas

BY JOANIE WEXLER

Atlanta

MCI Communications Corp. simultaneously broke into the Internet access and on-line services businesses last week with products and services aimed at getting the masses to use MCI for their on-ramps to the 'Net.

MCI — the last of the Big Three phone companies to offer Internet access — introduced internetMCI, which is available immediately at various speeds and access methods (see graphic). It is a package of software and services meant to facilitate electronic commerce for merchants and consumers.

InternetMCI bundles dial-up, dedicated, frame relay and ISDN access options with software that lets consumers tap into the Internet and a new electronic mall on MCI's net.

The mall, called marketplace-MCI, is a pot sweetener to get users to choose MCI for Internet access, analysts said. It will be available in January.

MCI has built the mall on its own 45M bit/sec backbone — to be upgraded to 155M bit/sec next year. Merchants can promote their products on the mall with still images and full-motion video clips for monthly fees of $2,000 and higher, said John Donahue, MCI's vice president of marketing.

MCI is offering services to help retailers on the mall deal with the technical and operational aspects of conducting business on-line. It will also provide consulting to help firms effectively promote their goods via an electronic medium.

For firms that have yet to figure out how to get customers accustomed to on-line shopping, that marketing assistance could be key.

"It is not clear yet what we must do to get people to start going to [an electronic] mall," said the telecommunications director of a large catalog retailer investigating electronic commerce.

Big Three Internet access options

Carrier	Access method	Speeds
AT&T	InterSpan frame relay	Up to T-1
MCI*	Asynchronous dial-up	9.6K, 14.4K and 28.8K bit/sec
	Dedicated lines	56K bit/sec to T-1, fractional T-3, T-3
	ISDN	64K or 128K bit/sec
	HyperStream frame relay	56K bit/sec to T-1, fractional T-3, T-3
Sprint*	Dedicated lines	56K bit/sec to T-1, T-3
	Frame relay	Up to T-1

*Both MCI and Sprint said that next year they plan to expand their access offerings to fast-packet services such as ATM.

The Lexington, Ky., catalog company Gall's, Inc., which sells products to the public safety market, has been briefed on internetMCI and marketplaceMCI. Mark Trimble, executive vice president, said while he is interested in the medium, "We question our ability to reach such a well-defined niche cost-effectively" with it.

For consumers, MCI is offering $19.95-a-month access to the Internet and marketplaceMCI via various dial-up links. Through partnerships with FTP Software, Inc. and Netscape Communications, it is providing a $49.95 software package that includes TCP/IP plus software that allows users to access and perform transactions at the electronic mall.

ALL THE RAGE

InternetMCI comes on the heels of Microsoft Corp.'s entry into the on-line service business (*NW*, Nov. 21, page 1) and reflects a trend among carriers to push their businesses beyond basic transport services, said Steve Sazegari, a senior consultant with Ryan Hankin Kent, a San Francisco consultancy.

In providing Internet access, MCI faces competition not only from its long-distance rivals, but from traditional Internet access companies, as well cable television companies and on-line services providers such as CompuServe, Inc.

Price could be a stumbling block. MCI is providing an alternative to shopping and information services from America On-Line, Inc., CompuServe, Prodigy Services Corp. and others at roughly double their average $10 monthly access fee, noted Stephen Franco, an analyst with The Yankee Group in Boston.

Among the mall alternatives is rival AT&T's $9.95-a-month PersonaLink electronic shopping and messaging services, launched in September.

AT&T also offers Internet access — as a separate service (see graphic) — though AT&T PersonaLink spokeswoman Gail Silver said, "It would certainly be possible to expand PersonaLink to the Internet."

Likewise, Sprint Corp., which has had Internet access services since 1992, plans to get into electronic commerce through partnerships in 1995.

©MCI: (800) 779-0949.

UUNET set to offer turnkey Web service

BY ADAM GAFFIN

Falls Church, Va.

UUNET Technologies, Inc. last week unveiled one-stop shopping for companies that want to get onto the Internet's World-Wide Web.

UUNET will partner with Interse Corp. of Hamilton, Va., to do everything from design Web pages to host them on a secure server farm with round-the-clock monitoring and access speeds of up to 10M bit/sec.

Alan Taffel, vice president for marketing at UUNET and former president of the Frame Relay Forum, said his company will handle the Internet connectivity and server maintenance, while Interse will be responsible for designing and updating corporate Web documents.

The Web is a distributed Internet-based system of databases and documents connected via hyperlinks. It is quickly emerging as a major way for companies to do business over the Internet.

Taffel said UUNET can link Web documents directly to customer's back-end databases for on-line transaction processing. But he said few customers are looking for that at this point, in large part because of security concerns.

Instead, they are far more likely to want to develop on-line help desks and similar information-sharing applications, he added.

Terry Myerson, an executive with Interse, said many companies are worried about getting a bad reputation among Internet users by putting up ordering systems. This is because of the widespread publicity given Canter & Siegel, a Phoenix law firm that won lasting Internet notoriety earlier this year for posting ads in several thousand on-line conferences, he said.

Stephen Franco, an analyst with The Yankee Group consultancy in Boston, said the new service should prove attractive to companies that want to experiment with the Web without committing large amounts of time or money.

Pricing starts at $300 a month for T-1 access and $900 for 10M bit/sec access to the Web. Fees for designing Web pages start at $5,000.

©UUNET: (703) 204-8000; Web URL: http://www.uu.net.

Early adopters pick and choose among BackOffice components

BY PEGGY WATT

Some of Microsoft Corp.'s enterprise network products are getting in the back door through the company's BackOffice server software bundle now that the first version of that package is complete.

Microsoft last week shipped Systems Management Server (SMS), the final part of the Windows NT 3.5-based five-product bundle announced in September.

While users are giving a once-over to all of the BackOffice components from Microsoft Mail to SQL Server, they are not all embracing the unit wholesale.

Issues of compatibility with existing systems and other concerns have prompted even the most enthusiastic early adopters to choose among BackOffice's parts.

But some early adopters are already using BackOffice for the mission-critical applications that Microsoft covets.

BackOffice components

- Windows NT 3.5
- SQL Server 4.21a
- SNA Server 2.1
- Systems Management Server 1.0
- Microsoft Mail 3.2 (to be replaced by Exchange Server)

WINDOWS DOWN SOUTH

For example, Bank South Corp. in Atlanta is putting Windows NT on 150 servers at more than 150 branches. The company will install Windows for Workgroups on 2,000 workstations and upgrade them to Windows 95 when it ships.

"Six or eight months ago, we would've been reluctant to use Windows NT," said Al Schulman, project manager at the bank. Since 1986, Bank South has run its custom teller program on an IBM 4700 with desktop terminals; now the vertical application is being ported to SQL Server for Windows NT.

"We're scaling down," Schulman said. "The application drove us to it."

Windows NT's 32-bit, multitasking

See **BackOffice**, *page 75*

IBM takes home the blue at management bake-off

BY JIM DUFFY

Santa Clara, Calif.

IBM emerged as the overall winner in a shoot-out between some of the leading network and systems management platforms at the recent Enterprise Management Summit '94 show here.

The event was designed to show how offerings from Computer Associates International, Inc., Digital Equipment Corp., Groupe Bull SA, Hewlett-Packard Co. and IBM would fare in a multivendor environment.

Vendors had 90 minutes to demonstrate how their platforms handled 13 management tasks, such as autodiscovery, multiple alarms, software distribution, security and workload management. A 14th scenario lets vendors show off the unique attributes of their products.

On a scale from 1 to 5 — 1 being the least capable and 5 being the most — IBM's NetView for AIX came in at 4.29, followed by Digital's PolyCenter NetView at 4.06, HP's OpenView at 3.74, Bull's Integrated Systems Manager at 3.19 and CA's CA-Unicenter at 3.12.

IBM also came out on top in five of the 14 scenarios and was the only vendor that participated in all 14 scenarios. Digital won three, CA and HP won two, and Bull won one.

IBM won accolades for NetView for AIX's ability to integrate asset information into a trouble-ticketing database, manage DECnet and Systems Network Architecture environments, and recognize and restart frozen applications.

The results are in

Eight judges at Summit ranked net management systems, with a score of five being the most capable.

IBM	4.29
Digital	4.06
HP	3.74
Bull	3.19
CA	3.12

Digital impressed judges with PolyCenter NetView's ability to quickly discover managed nodes — 1,600 nodes in 4 minutes. PolyCenter NetView also received plaudits for its use of automated scripts to solve a print spool problem and to kick off Simple Network Management Protocol GET and SET commands for tracking a new router configuration.

HP received high marks for its high level of integration. The company showed that OpenView could launch 12 third-party applications to resolve the 14 management scenarios.

Bull won kudos for its DBAexpert database management application, network analysis tools, integration with Novell, Inc.'s NetWare Management System, software distribution, security and trouble tracking. And CA impressed the crowd with Unicenter's file, tape, report distribution and security management offerings.

"I don't think I saw anything surprising — good or bad," said Randy Smith, project manager at United Parcel Service of America, Inc. in Mahwah, N.J., and one of the judges on the Summit panel.

User turns to Centillion switch to handle IP address shortage

BY MICHAEL CSENGER

Newark, N.J.

Token-ring switching arrived in the nick of time for one LAN manager whose router-based network has nearly run out of IP addresses.

Public Service Electric and Gas Co. (PSE&G) recently tested one of the first token-ring/ATM LAN switches from start-up Centillion Networks, Inc. and will soon deploy production units at its headquarters here. The switches will alleviate PSE&G's IP address shortage by enabling the firm to replace multiple routed subnets with a single collapsed subnet supporting multiple token-ring hubs.

What could have been

Alternatives considered by PSE&G to Centillion's Speed Switch 100

Alternative	Reason for rejection
Running another routing protocol or remasking the existing subnet.	Labor-intensive and difficult to manage.
Petitioning the Internet for more addresses.	Honest approach, but requires meshing and managing two separate IP nets.
Pirating IP addresses as needed.	Unsportsmanlike; bound to cause problems down the road.

Centillion's Speed Switch 100 is the first of its kind. The six-port device is an Asynchronous Transfer Mode switch at heart, turning all traffic into ATM cells across its backplane. But it can also be used — as PSE&G is employing it — for simply switching token-ring traffic across a LAN.

PSE&G is adding two switches to its router-based network, which is divided into nearly 220 token-ring subnets that have almost exhausted the company's IP address base. The switches will collapse about a dozen subnets into just two, freeing up IP addresses and boosting performance.

BETA INSIGHTS

"I'm in a real tight spot," said Tim Weeks, senior staff information technology engineer at PSE&G. "If we continued to grow the network as we were doing, we would run out of addresses."

IP addresses are doled out upon request by an Internet governing committee, and a company's given allotment of addresses can run out as its network grows. A new address base can be added, but it entails cumbersome management and administrative work.

"That factor alone has really compelled us to look at LAN switching [for token ring], not to mention the performance benefits and simplified management that Ethernet switch users have realized for some time," Weeks said.

He started beta-testing the Centillion switch in August and is satisfied with its stability in a lab environment. PSE&G will deploy two new units at headquarters by year end.

In the current environment, token-ring hubs support as many as 80 users per subnet. Multiple hubs then feed into routers, which fil-

See **Centillion**, *page 8*

INTERNET *tip*

BY ADAM GAFFIN

One in a series of occasional tips on Internet-based information services.

E-mail over the Internet

Even if your Internet access is limited to E-mail, there is still a vast amount of information you can retrieve from Internet servers and databases. Bob Rankin's "Accessing the Internet by E-mail" is a document that shows how you can use E-mail to retrieve files from:

- ✓ **Gophers**
- ✓ **World-Wide Web servers**
- ✓ **Listservers and databases**

To access: Send an E-mail message to listserv@ubvm.cc.buffalo.edu. As your message, type: GET INTERNET BY-EMAIL NETTRAIN F=MAIL.

Gaffin can be reached via the Internet at agaffin@world.std.com.

Introducing Version 4.0

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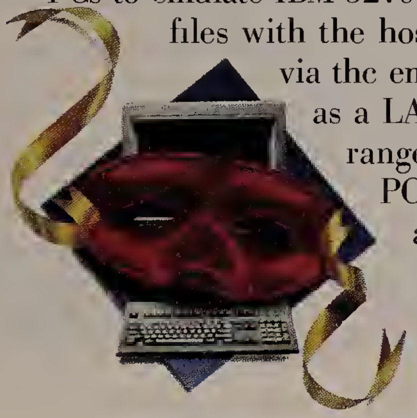

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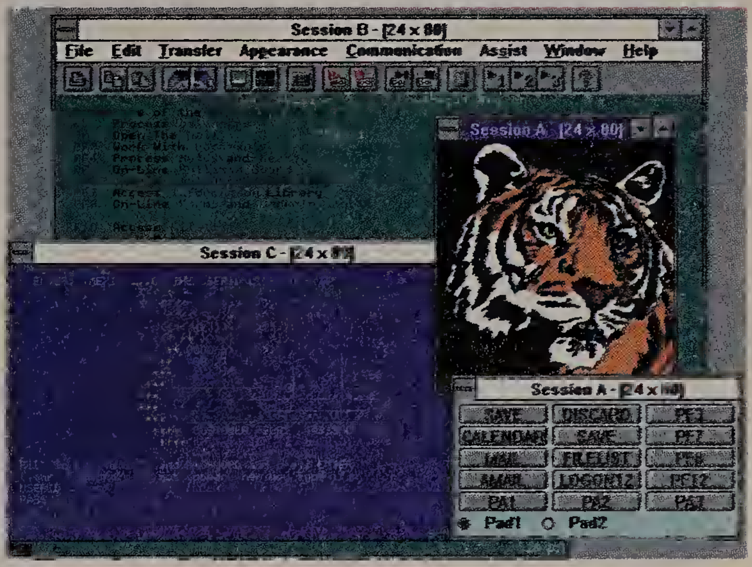

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IBM

Norton puts pcAnywhere on server for remote access

BY PEGGY WATT

Santa Monica, Calif.

Symantec Corp.'s Norton Computing Division is this week releasing a server version of its pcAnywhere remote access program that ensures better security and central management.

Norton pcAnywhere Access Server provides the same functions as the single-user version, enabling users to call up and access files and applications from remote desktops as if they were running locally. It also lets net managers control users' remote access with a number of new security features, such as multilevel password protection, a callback option and time-out limits, said Michael Kerman, senior product manager for Norton pcAnywhere Access Server.

"Customers wanted a central dial-in solution," Kerman said, to get a better handle on remote users. For example, it was previously possible for pcAnywhere users to dial in to their desktop machines through local modems without ever having to enter a password.

With the server version, managers can give nomadic users access only to certain server files or applications, such as E-mail, or to specific databases that may reside on the pcAnywhere server or another server on the LAN.

Also, they can set configuration, access and other parameters from the server, rather than adjusting the pcAnywhere copy on each user's workstation.

"I think pcAnywhere has been a solid product for the past two years, and it's the fastest thing we've tested," said a net manager for a large financial firm in New York. He has as many as 90 users dialing in to eight personal computers on the LAN and was looking for better security and management options. "We've been asking for the server product for some time," he said.

Norton pcAnywhere Access Server can support as many as eight simultaneous remote control sessions. It runs on OS/2 because Symantec needed the multitasking, 32-bit operating system functionality, Kerman said. The client portion of the product is the existing pcAnywhere for Windows.

The $329 entry configuration of pcAnywhere Access Server includes the server software and two client systems. More clients can be added in 10-packs priced at $1,032. A single copy of pcAnywhere costs $199.

©Symantec: (800) 441-7234.

Reality Check

Product: Prism Directory Manager
Company: Prism

The benefits:

- Lets administrators and end users browse through meta data for more efficient queries.
- Can export meta data into several front-end data access tools; can store data in several leading databases.

The drawbacks:

- Requires Prism Warehouse Manager.
- Directory Manager is not automatically updated when data warehouse information changes.

The user view:

"Right now, we either have to generate our own SQL statements or construct a separate application to view our meta data. With the Directory Manager, we can integrate the searching of meta data with our warehouse application."

Marcia Rhode, senior data administrator, Lower Colorado River Authority

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Newbridge preps feeder device for ATM switch

BY MICHAEL CSENGER

Herndon, Va.

Newbridge Networks, Inc. is prepping a feeder device for its 36150 ATMnet access switch along with new high-speed interface cards and software upgrades that address congestion control.

Two new software releases next spring will include new net management and flow control features along with interface cards supporting T-3 circuit emulation and Fiber Distributed Data Interface, said Irfan Ali, Newbridge's assistant vice president and manager of ATM. Newbridge is also addressing the limitations of its single-port Ethernet interface card in two ways.

The first is an internal four-port LAN card for Ethernet and token-ring traffic. The second option will be more ambitious: Newbridge is developing an ATM-based Ethernet switch that will serve as a feeder to 36150 ATM nodes.

Known in development as the LAN Service Unit (LSU), the device has not been finalized or publicly announced but will support local switching among eight to 10 Ethernet ports. A single 155M bit/sec OC-3 ATM pipe will connect the LSU to a 36150 serving as a campus ATM backbone switch or as a carrier edge device.

"The focus here is on wire-speed LAN interconnect through our networks," Ali said.

The LSU is optimized for interworking with the 36150 but could compete against Ethernet/ATM

See **Newbridge**, *page 76*

Centillion

Continued from page 7

ter traffic between subnets.

The Speed Switch 100s will be inserted between the hubs and routers. All hubs feeding into one switch can then share the same subnet address, as the switch controls traffic flow between hubs; previously, each hub had its own IP address.

A single token-ring connection will then link the switch to a router attached to the corporate backbone. PSE&G may ultimately run most of its token-ring LANs through such switches, but Weeks first wants to test the technology in a production environment.

While the Speed Switch 100 is built on an ATM core switching fabric, PSE&G will not use Centillion's ATM or other high-speed interfaces for some time.

"We're running 16M bit/sec token ring, and I don't see us heading up the ATM route in the next year. But if I kept my blinders on I would be a fool, so I do appreciate the [Speed Switch] option."

Other options to solve PSE&G's IP address shortage would have entailed labor-intensive subnet masking or the administration of a separate domain, Weeks said (see graphic, page 7).

FIRST OF ITS KIND

Centillion, a start-up based in Mountain View, Calif., is the first vendor to offer a true token-ring LAN switch, according to Todd Dagres, first vice president at the Robinson-Humphrey Company, Inc., a securities firm in Atlanta.

Other vendors, such as Network Systems Corp., offer bridge-like products that must pass traffic to a router and then back again in order to switch between ports.

Shipping as of today, the Speed Switch 100 costs $9,995 for an entry-level version with one four-port interface card.

A fully configured switch with six cards costs $42,500.

IP NETWORKS

Gateway handles thorny problems with addressing

BY ELLEN MESSMER

Palo Alto, Calif.

Start-up Network Translation, Inc. next week will begin shipping an IP network address translator that gives corporate networks direct access to the Internet even when their private addressing schemes are invalid for Internet use.

Called the Private Internet Exchange, the gateway sits between a firm's internal IP network and the public Internet, converting the sender's IP packet headers into a format acceptable for delivery over the Internet.

Network Translation's product spares companies the job of converting their entire internal routing and addressing schemes simply to give corporate users the ability to telnet, E-mail, or use Mosaic or file transfer on the Internet.

Exploding use of the Internet has led to a growing shortage of available addresses from the NIC.

At companies with internal TCP/IP backbone networks, systems administrators can assign computer network addresses for users in any way they please if data will be shared only within the organization.

But for use on the public Internet, as well, the addresses must follow the numbering scheme issued to each organization by the Internet's registration authority, the Network Information Center (NIC) in Herndon, Va.

Exploding use of the Internet has led to a growing shortage of available addresses from the NIC, compelling the center to demand engineering plans from companies to ascertain real need and prevent speculative hoarding of addresses.

After putting in TCP/IP nets, firms are belatedly coming to the conclusion that they would like valid Internet addresses without having to change computer software or applying to the NIC — a procedure now fraught with months of delay.

Network Translation's Private Internet Exchange gateway converts nonvalid IP addresses into valid ones. And it can also be set up to act as an Internet fire wall, letting corporate users out but restricting outsiders from getting in.

"This is the first product to do this," said analyst Noel Johnston at consultancy Axis international, Inc. in San Francisco. "There are existing products that act as fire walls, but the Private Internet Exchange is the first that converts private IP addresses to public ones."

KLA Instruments, Inc., a San Jose, Calif.-based semiconductor test equipment manufacturer, has been beta-testing the product on its internal IP net. "It's worked flawlessly," said Alan Helbush, systems administrator at the firm.

The Private Internet Exchange is also a useful security mechanism in keeping private IP addresses from the eyes of the outside world, noted John Mayes, Network Translation's founder and president. "Companies such as Bank of America, which has a huge IP network, are looking at this for the sake of duplicate addresses. They don't want to display internal IP addresses to the Internet."

The Private Internet Exchange could support up to three T-1 lines' worth of data without measurable delay in processing IP packets, Mayes said. The translator works according to Internet standard RFC 1597.

The product is available now, with pricing starting at $7,995.

©Network Translation: (415) 494-6387.

UB

Continued from page 4

allows users to interconnect multiple LAN segments per port over a switched backbone or to a corporate network.

But the greatest appeal of the GeoRim/E may be its price. At about $500 per port, the switch's price is comparable with that of Kalpana, Inc. Ethernet workgroup switches. But the Kalpana devices are not modular and lack an ATM uplink port and routing support.

"UB's getting the workgroup price for a chassis-based device," said one source who requested anonymity. "From a price viewpoint, it will certainly warrant a look."

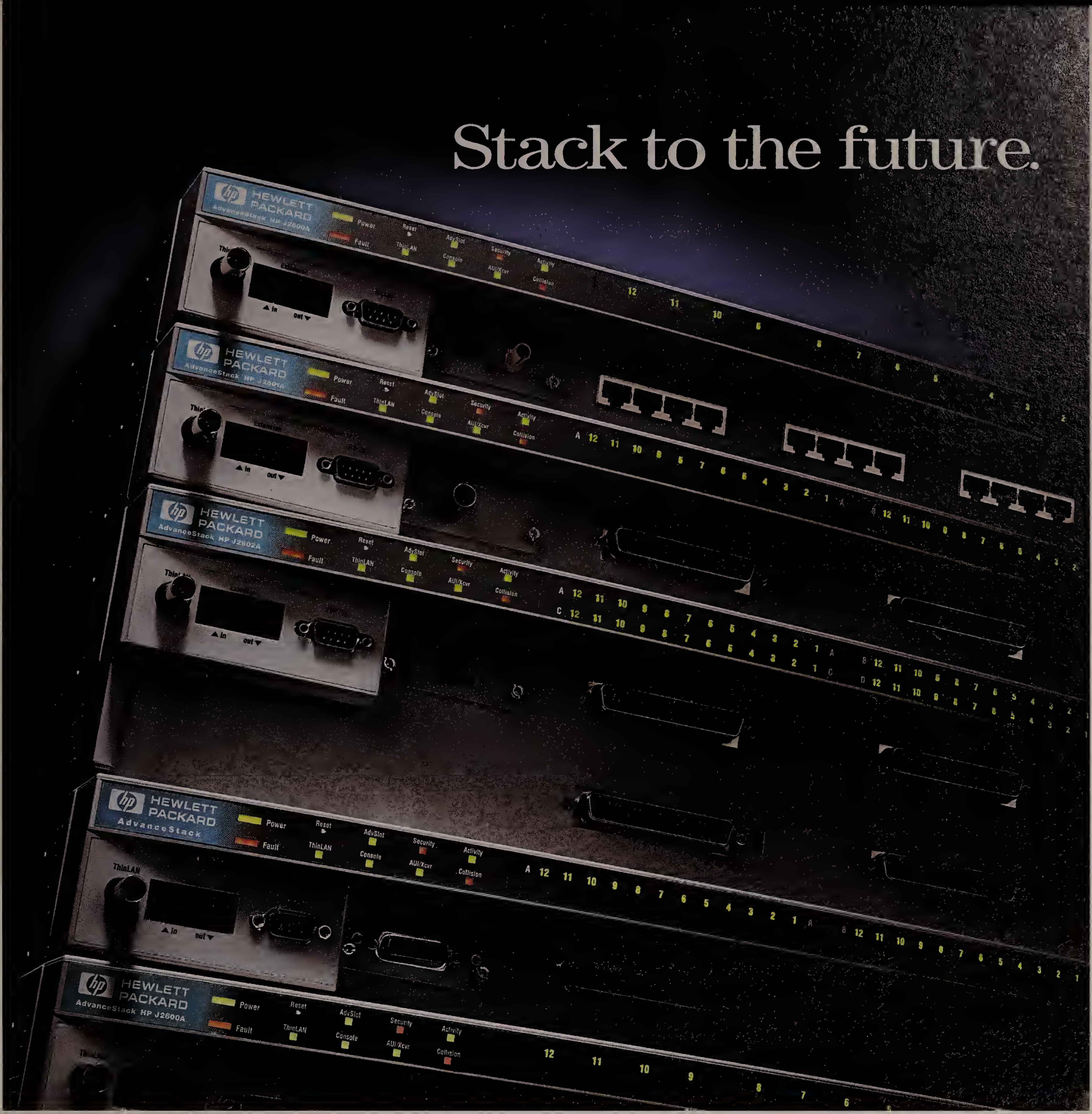
Sources said GeoRim/E will compete with edge routers from Agile Networks, Inc. and NetEdge Systems, Inc., as well.

GeoRim/E features three Motorola, Inc. 68040 processors (for handling either the LAN ports, routing and management, or uplink ports) and they can access system memory simultaneously. Each port can maintain a table of 256 media access control addresses and can filter, trap or block an illegal address.

For management, the switch supports the Simple Network Management Protocol GET, SET and TRAP commands, and Management Information Base II variables. It can be managed using UB's NetDirector or any other SNMP-compliant platform, sources said.

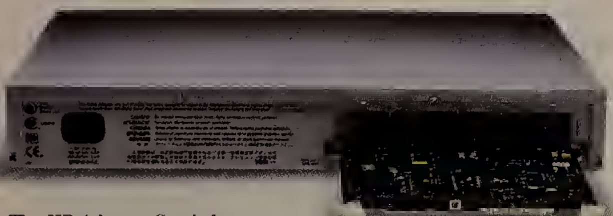
The 12 10Base-T port version of the GeoRim/E will be available Dec. 14 for $5,995. LAN interfaces for coaxial and fiber media will also be available then, and priced separately. FDDI and token-ring versions of GeoRim will be available next year.

©UB: (408) 496-0111.



Introducing the HP AdvanceStack family of 10Base-T stackable hubs.

If you like the front of our new hubs, wait until you see the back. That's where you'll find their unique expansion slot, and proof of their unprecedented flexibility. Buy the HP AdvanceStack today and you get a low-cost solution for your current setup. Then when you want additional functionality, all you need is a cost-effective expansion module, not a new unit. Add a lifetime warranty* backed by HP's reputation for quality and reliability, and we think you'll want to find out more about AdvanceStack right away.



The HP AdvanceStack features an expansion slot that offers a flexible upgrade path to SNMP, bridging/routing, high-speed backbone connections and more.

- Full stack manageable via a single SNMP module
- Supports HP OpenView network management software
- Each hub ships with HP Stack Manager, a Windows-based management solution
- Management bus separate from data bus
- Maximum configuration: 784 nodes, 16 hubs
- Available in 12-, 24-, and 48-port models
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- MTBF: 274,000 hours (12-port model)
- Starting under $61/port††

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ATM Report

Continued from page 1

there was one surprise during the last quarter: We expected fireworks regarding IBM's attempt to push its 25M bit/sec ATM technology as a standard with the ATM Forum. But we didn't see any.

In late August, a consortium – the ATM25 Alliance – was formed to promote the 25M bit/sec interface. Members of this consortium attended the September meeting of the forum, and some observers expected them to reintroduce the 25M bit/sec technology for approval. (The proposal was originally rejected by the forum in August.) That didn't happen, but many forum sources say it's only a matter of time before the 25M bit/sec option is accepted.

By building the consortium, IBM demonstrated broad support for 25M bit/sec ATM, and product announcements from other vendors are expected shortly. In the end, that is what will sway the forum.

Here's what the forum was working on during the past quarter:

User interface standards

Current status: **4**
Previous status: **4**

Version 3.1 of the forum's User-Network Interface (UNI) was approved by the technical committee in September and will be available to the public in early 1995. In many ways, the UNI is the most important ATM standard since it defines how user equipment is linked to the network.

Version 3.1 reconciles the forum UNI and the international signaling standard Q.2931, although the International Telecommunication Union's (ITU) version does not have the depth of traffic management features found in the forum's. The forum version leaves less room for vendor interpretation, which is key to more compatible products.

Like the earlier UNI documents, the Version 3.1 material will be presented as a packet of information with content that cuts across the forum's technical committees, borrowing from signaling, the physical layer and other areas. This will be the last of the broad document releases of this type. Version 4.0 and future UNI releases will be provided as updates to specific committee documents.

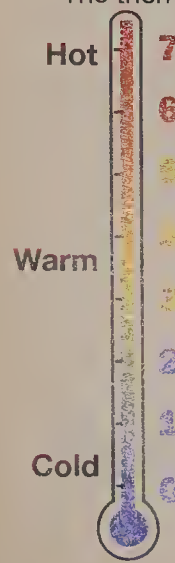
For more details

Many of the standards and specifications discussed in this report are being developed by the ATM Forum. Here's how to find out more about the forum:

Phone: (415) 578-6860
Fax: (415) 525-0182
E-mail: info@atmforum.com.
Or access the forum's World-Wide Web site; the URL is http://www.atmforum.com.

Status coding

The thermometer index has eight interoperability states.



7 **Product certification is available to users from at least one source.**
6 **Multivendor interoperability has been demonstrated based on structured and approved tests.**
5 **There are conformance tests established, and at least one agency to administer them has been defined.**
4 **There is an approved standard available and reference implementations for review.**
3 **There is a draft standard available.**
2 **A standard is being developed.**
1 **There is a consensus on requirements and a body acknowledged as a credible source of standards.**
0 **There are no standards defined, and no clear mandate to create standards has been accepted by any organization.**

UNI Version 4.0 will be ahead of many of the ATM products, and vendors will be rushing in 1995 to catch up. Look for Version 4.0 support first from hub and customer premises equipment vendors, with network switch vendors last – they have the most work to do.

Switch and carrier interworking standards

Current status: **3.5** (formal approval is pending)
Previous status: **3**

Considerable progress has been made in the intercarrier and interswitch interface area. This is a critical interoperability concern because it governs both how carrier services would interconnect and how private ATM switches would combine to build a single network.

The Broadband Inter-Carrier Interface (B-ICI) describes how multiple carriers providing ATM services or other services, such as frame relay, provisioned over ATM would be interconnected. This topic is of growing importance, and the first intercarrier forum on frame relay interconnection was sponsored by Bell Communications Research in October.

The B-ICI Version 1.1 document was ratified as expected at the September forum meeting, and there was some discussion of B-ICI signaling between network operators. Version 2.0 is scheduled for release in 1995; it is hoped that it will include intercarrier signaling to facilitate ATM interconnection.

Comments from the straw vote on the carrier M4 management interface, the interface between a carrier network management system and the carrier network, were resolved in September. The interface is now ready for a formal final vote by forum members, and documentation will be published by early 1995.

The work will harmonize carriers' ATM management offerings and facilitate management of multivendor carrier ATM networks.

Of immediate interest to users was the progress in the Private Network-to-Network Interface (P-NNI), which covers how calls are set up between multivendor switches and how network topology and route selection information is passed over these interfaces.

In August, the P-NNI working group decided to split the call handling portion of the P-NNI out of the planned Version 1 release in order to get specifications out to equipment providers that are already delivering products. That's designed to ensure that, for example, ATM hubs from different vendors could work together.

This subspecification was originally known as the Phase 0 release but has been renamed the Interim Inter-Switch Signaling Specification. This spec was approved for a straw vote, and the results of that vote will be reviewed at the November meeting.

If approved, the specification should go out to formal ballot by year end, and approved documentation will be available in early 1995.

After the UNI issues, interswitch and intercarrier interoperability issues are the most likely to be encountered by users in the near term. Look for this critical area to advance in status in the next report.

Adaptation-layer standards and classes of service

Current status: **3.5** (formal approval is pending)
Previous status: **2**

The debate on rate-based or credit-based flow control for available bit rate (ABR) data services was resolved at the September forum meeting – in favor of the rate-based system. ABR is an alternative to "classic" ATM functions such as constant bit rate and variable bit rate services. With ABR, connections can expand or contract as application needs and network capabilities dictate.

After the August meeting, there was some indication a compromise strategy that allowed both the rate-based and credit-based flow control schemes for ABR to coexist would gain support, but the September discussion quickly settled on the rate-based proposal.

Rate-based flow control for ABR service can be applied between any two points selected by the network builder; these points become the virtual source and virtual destination for a rate feedback exchange.

A data connection is set up with a minimum and maximum data rate, and would operate at the maximum rate until a change was negotiated via a rate feedback message. This can be a simple binary command to throttle back or not throttle back that's carried in the flow control bit of the cell.

In this case, any ATM switch compatible with the forum's 3.0 UNI would be compliant with the rate-based flow control requirement.

Feedback can also be explicit, meaning that a special operations and administration control cell can carry the actual rate desired, providing greater control over the information flow.

In its explicit form, the rate-based scheme can offer the same level of control as the credit-based alternative proposed by some vendors, providing that the rate-based system is applied hop by hop. Perhaps this equivalence induced supporters of the credit-based system to switch sides; the vote was nearly unanimous, and everyone is reportedly now working enthusiastically on getting the rate-based draft ready for presentation in March 1995.

If approved by a straw vote at that time, the final vote and release of the documentation would be expected in the second quarter of 1995. A status upgrade can be expected in that time frame.

Quality of service definitions and QoS assurances

Current status: **1**
Previous status: **1**

There has been no significant advancement in this area since the previous report.

How the ATM Interoperability Report works

This report is a quarterly update on the industry's progress toward providing ATM products and services that work together. It is designed to encourage vendors to make interoperability a prime concern in product development.

Using a thermometer index, we chart ATM's progress from a "cold" state, where there are no standards, to "hot" status, where there is product certification, in six vital areas of interoperability:

- **User interface standards**
  Standards describing the connection between a user device and a network, or another device whose role is to emulate network services.
- **Switch and carrier interworking standards**
  Standards describing the interface between carrier networks or between ATM switches and/or nodes.
- **Adaptation-layer standards and classes of service**
  Standards describing the conversion of native network user information, such as frames and bitstreams, into cells.
- **Quality of service (QoS) definitions and assurances**
  Standards or recommendations that define the quality of ATM service and means for enforcing specified service levels, or protocols designed to control or assure QoS.
- **Signaling standards**
  Standards defining exchanges between user equipment and the network for connection management or service management.
- **Application services and APIs**
  Standards defining higher layer protocols to be used with ATM to provide specific application services — including convergence functions that adapt ATM transport to other services like frame relay — and LAN emulation and encapsulation standards. Also includes APIs designed to provide direct application access to ATM services.

Signaling, including SVCs and LMIs

Current status: **3.5** (formal approval is pending)
Previous status: **3**

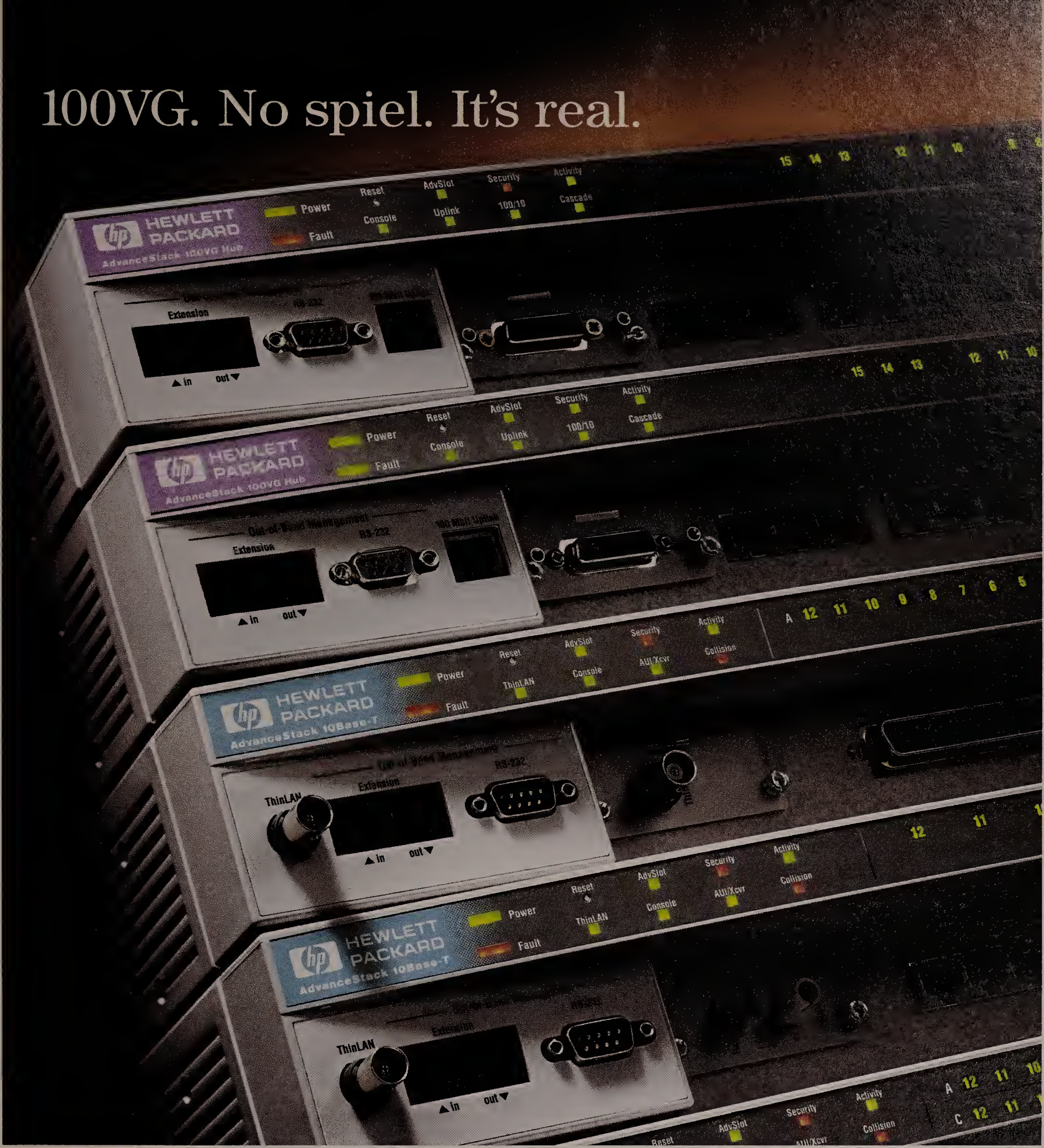
Signaling holds ATM networks together, passing requests for connection and status information between network elements, as well as the network and its users.

To date, most signaling work has focused on the user/net area to support the early work by hub vendors, which rely on switched virtual circuits (SVC), and carriers that use the Interim Local Management Interface to report on the status of permanent virtual circuits.

Within the forum, work continues on the signaling changes required for the UNI Version 4.0. Progress here is good, and the late 1995 target seems still to be in reach.

Leaf-initiated joins, where outside parties can join a conference call themselves rather than having to be called in by the call's organizer, is the largest functional change for Version 4.0. Another change is support for a proxy signaling station, a station that can set a call up for another station that lacks signaling. That might be useful in distance-learning applications, where a student might have a simple video terminal.

See **ATM Report**, *page 12*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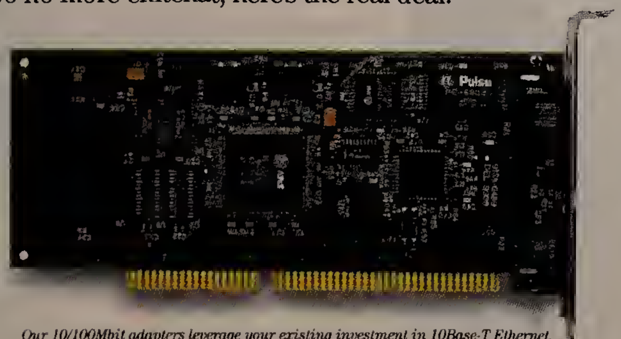

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ATM Report

Continued from page 10

Some progress is now being made in interworking between ISDN and ATM. The ITU has developed recommendations on how narrowband ISDN's Q.931 signaling would be converted from or to ATM's Q.2931 form, and the forum will likely include this in the next release of its signaling specification.

That will, for the first time, enable users to make voice connections from a non-ATM device through an ATM network other than in simple pass-through circuit-emulation mode.

Since there is no work being done on converting traditional T-1 trunk signaling – of the type used by private branch exchanges – to ATM, voice users that want to employ their PBXs to establish SVCs through an ATM network will have to think about converting trunks to ISDN signaling.

Point of reference

The previous ATM Interoperability Report was a two-part article that appeared in the Aug. 15 and 22 issues of *Network World*.

The net management working group, still maintaining its ambitious schedule, resolved the comments on the M3 management interface, which is the interface between a private net management system and the public net management system. M3, in essence, establishes the private view of public ATM services.

This critical area will go out for formal voting, and a document should be available by early 1995.

Network management interface approval will complete the minimum signaling set required as the basis for interoperability testing, so the status of this area will advance the next full step in the first quarter of 1995.

Application services and APIs

Current status: **2**
Previous status: **2**

LAN emulation is the key to interoperability between traditional LANs and ATM networks. Version 1.0 of the LAN-emulation specification was targeted for release to a straw vote after the September meeting, and the working group worked feverishly for a last-minute release of the text to the technical committee.

They made it, and LAN emulation is still on track for a final vote, with publication of the documentation slated for early 1995. Since no early drafts of this standard are available outside the voting membership yet, the status of this area cannot be advanced.

Work is also starting on the next issue – how to map network layer protocols to ATM. The issue is how ATM LANs could be linked to form what may become global ATM networks.

An interest group at the September meeting discussed the issues and accepted three proposals on specific methodology. Not surprisingly, the proposals run the gamut from one that retains Level 3 routing (and routers) largely intact, to one that replaces Level 3 routing almost entirely by the P-NNI routing being developed for the Phase 1 release.

For users, there is probably no ATM issue more important than the network layer protocol handling. It is on this issue that the question of whether ATM will coexist with – or "eat" – routers will be decided. At the next forum meeting, discussions on network layer handling will start in the P-NNI group. Nobody is expecting the diverse views to converge anytime soon.

Work on an ATM-specific application program interface (API) also continues. The forum recognizes that while LAN emulation will serve the needs of existing applications, new applications must be ATM-aware to take advantage of all ATM features. Specs for this API are expected in 1995.

WRAPPING IT ALL UP

Overall, 1994 was a pretty good year for ATM interoperability. Formal votes on network management, LAN emulation, P-NNI and other important areas are due late this year or in 1995, so public documents on the forum positions will be available to all vendors and testing labs.

At the current pace, both the UNI and P-NNI interfaces will probably be fully defined and supported by third-party testing by the end of 1995, and users will have their first impartial assurances of interoperability.

The street price of ATM to the desktop will probably reach $1,000 in 1995, and the combination of interoperability assurance and price will be enough to encourage the first large-scale, nonexperimental deployments of premises and campus ATM.

Emphasis will then begin to shift to carrier ATM issues, more advanced ATM LAN internetworking and ATM APIs. We'll keep you updated in the next ATM Interoperability Report, which is scheduled to appear in early March.

➾Nolle is president of CIMI Corp., a technology assessment firm in Voorhees, N.J. He can be reached at (609) 753-0004 or via MCIMail at 349-5845.

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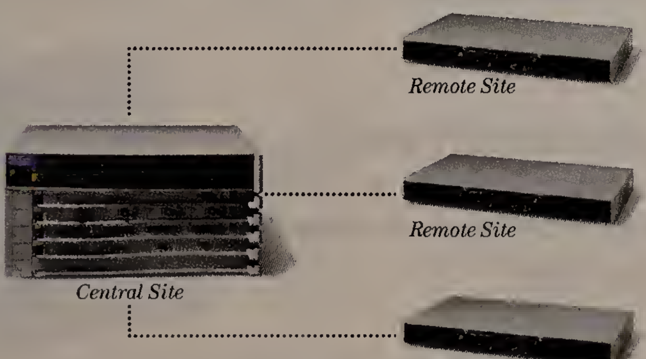

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ENTERPRISE INTERNETS

Data Network Architectures, Standards, Equipment and Management

NET stakes new ground as a systems integrator

BY MICHAEL CSENGER

Sterling, Va.

As an example of the retrenching that has returned Network Equipment Technologies, Inc. (NET) to profitability this year, the company is seeding a new line of business aimed at systems integration and installation services.

Without much fanfare, NET has outfitted a systems integration facility at its NET Federal, Inc. division based here. The facility played a crucial role in clinching one of the largest corporate accounts NET has won this year — Federated Department Stores, Inc. — and may in time be spun off as an autonomous business unit.

Federated is swapping out a StrataCom, Inc. IPX-based network for about 200 NET IDNX Micro 20 multiplexers, as the company strives to consolidate disparate networks that came with its acquisition of several department store chains over the last several years.

In the nearly haphazard way that some deals go, Federated learned of NET Federal's office while the companies were in negotiations. The federal division, which accounts for about 25% of NET's business, has long provided enhanced installation support services as part its government contracts, explained Lonnie Essex, senior manager of NET's Federal Service and Integration operation.

> **"To put a dollar value on this would be an injustice....It's even harder to quantify time wasted [putting] things in order."**
>
> —Hunter Harris

"Our government contracts require us to put together a lot of different bits and pieces that fill about nine or 10 cabinets and get shipped off to distant locations," Essex said. "We used to do that work on-site, integrating DSUs and modems or video equipment, whatever they had, but inevitably Murphy would show up. We'd have to spend a day just gathering boxes together and then another day trying to track down a missing cable."

So NET Federal started integrating all components at its Sterling office. Every cable and bolt is put in place so systems can ship as a complete unit ready for installation.

Federated heard about this and asked if NET could provide the same level of support to its corporate customers. Federated's stores are not staffed with network technicians, and the company was concerned that loading dock workers might unpack an IDNX Micro 20 and send it up to the stereo showroom.

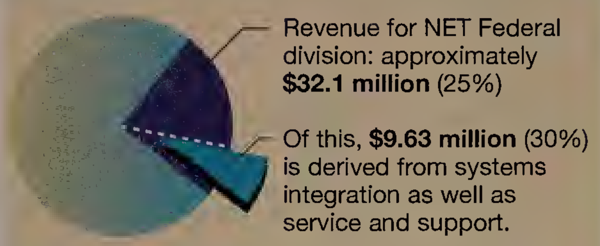
"When we realized what they could offer, it was a critical piece of the deal," said Deborah Phillipeck, Federated's vice president of networks and technology. "In past experience, we've found that equipment ends up getting lost when it arrives piecemeal from various places."

NET offered a one-stop plan, configuring its Micro 20s and integrating them on a single rack with modems and channel service units that Federated purchased itself. "We ship it out and have one of our own technicians simply transfer the cabling from their current equipment into the new rack," Essex said.

"To put a dollar value on this service would be an injustice," said Hunter Harris, Federated's network manager. "We used to have three or four people working full-time just to handle the logistics of multivendor installations. It's even harder to quantify the time wasted over lost equipment and the travel expenses of having people come back another day to finally put things in order."

Seeding the field

NET revenue for six months ending Sept. 25: **$128.4 million**



NET Federal division could be a model for a new systems integration business line.

GRAPHIC BY SUSAN J. CHAMPENEY

"Some other vendors have offered to do something similar, but only if they could sell us the modems themselves and work the deal for a premium," Phillipeck said. "NET just incorporated it into part of their negotiations."

NET makes a profit on the service, Essex said, and may cultivate systems integration as an important sideline.

"Stemming from our government work, it just seems like a good extension," he said.

©NET: (415) 366-4400.

IBM to launch less expensive 3174 controller

BY MICHAEL COONEY

Raleigh, N.C.

IBM last week announced a low-end 3270 controller that marks a new low for the company — in price per port, that is.

The new 3174 Establishment Controller Model 95R is about $156 per port when fully configured, down from the current low of about $260 per port.

IBM expects the 95R will help encourage users of 3274 controllers, more than 8,000 of which are still installed, to migrate to the 3174 era. Users of older model 3174s should also be interested in the 95R due to its cost per port and support for a single 256K bit/sec Synchronous Data Link Control link with a Systems Network Architecture mainframe. Older 3174s and 3274s can support speeds only up to 64K bit/sec.

"The 95R should be attractive to any users who are expanding their SNA nets and looking for a low-cost, tabletop-sized box that is capable of efficiently handling SNA connectivity better than their existing equipment," said Don Hamilton, a member of IBM's Networking Systems support team.

The box does not support some of the advanced features of its bigger brethren, however. For example, it does not offer TCP/IP, Advanced Peer-to-Peer Networking or frame relay connectivity options like IBM's larger 3174s.

Controlling the market

IBM sold 7,500 3174 controllers in 1993, bringing its worldwide installed base of 3X74 controllers to 201,213, according to IDC of Framingham, Mass. Of this base, more than 8,000 are the older 3274 type, IBM said.

What it does support is as many as 32 users running five sessions each with as many as three hosts. Users can cut and paste and hot-key between those sessions. In addition to the 256K bit/sec SDLC line, the box can support an X.25 and bisynchronous connection to other hosts.

The 95R also runs a customized version of the Configuration-C software that runs larger 3174s. Known as Configuration-N, the software supports Central Site Configuration, which lets the 95R receive software updates from a central host running NetView Distribution Manager.

"The 95R is a tactical weapon designed to exploit the fact that many users are still growing their SNA nets and need a cheaper method of connecting terminals and PCs," said Thomas Nolle, president of the CIMI Corp. consultancy in Voorhees, N.J. "Our studies show that the installation of dependent LUs or 3270 devices will actually peak this year and then begin to slowly fall off in the next few years."

The 95R is also a tactical response to competitors such as Memorex-Telex Corp., IDEA and Decision Data — all of whom have controllers that break the $200 price-per-port barrier.

The 95R will be available Dec. 2 for $4,995, including Configuration-N software.

©IBM: (800) 426-2255.

BRIEFS

Bridgeway Corp. has started shipping **MapSync 1.0,** a net management application that synchronizes object database and network topology mapping functions across dissimilar management platforms.

Using the Simple Network Management Protocol, MapSync 1.0 provides synchronization and coordinated updating among Hewlett-Packard Co.'s HP OpenView, IBM's NetView for AIX and SunSoft, Inc.'s SunNet Manager and Encompass management platforms. MapSync 1.0 can read and update each platform's object database and topology map, and generate an audit trail on all operations performed.

Bridgeway also announced a new version of its **EventIX** event processing application and tool kit for SNMP and legacy management systems.

EventIX 2.0 supports SNMP Version 2 and a graphical user interface for developing, debugging and implementing EventIX applications.

MapSync 1.0 starts at $3,000 and is available now. EventIX 2.0 starts at $15,000 and will be available in first-quarter 1995.

Bridgeway: (508) 683-3626.

Stratus Computer, Inc. is now distributing Grapevine Systems, Inc.'s **Enguard** enterprise monitoring and alarm software on its Continuous Processing Systems.

Enguard is an **automated alert package** that provides 24-hour, seven-day-a-week event monitoring of hardware and mission-critical applications. When problems occur, Enguard notifies users of the event, takes automated corrective action and escalates alert status if corrective measures are not enacted within a specified time period.

Enguard is available now from Stratus for $42,000.

Stratus: (508) 460-2000.

Cisco Systems, Inc. has announced that Executive Vice President **John Chambers** will succeed **John Morgridge** as president and chief executive officer of the internetworking company in January 1995.

Morgridge will become chairman of the board of Cisco. Current Chairman Donald Valentine will become vice chairman.

TimeStep Corp., an Ontario-based affiliate of Newbridge Networks Corp., will ship a Windows personal computer-based security product called Permit for encrypting and decrypting data over TCP/IP networks.

Permit, which costs $200 per PC, includes SNMP Version 2-based management and agent software for controlling encryption between end points based on net addresses.

TimeStep: (613) 599-3610.

ICL Enterprises North America has announced plans to ship early next year an application program interface tool kit for its AccessManager product called Generic Security Service, which runs on ICL Unix System V Release 4 and Sun Microsystems, Inc. Solaris 2.3 platforms.

ICL: (703) 648-3300.

INTERNETWORKING MONITOR

by Scott Bradner

A problem with there being no 'there'

The enigmatic MCI advertisement says that there will be no "there," it will all be "here," as if that condition is off in the future "somewhen." It is not; we are here and not there, already.

The Internet is intellectual connective tissue. From your desk, you have access to material from a diverse range of cultures from all parts of the globe. Likewise, others have access to the multitude of cultures here.

Back a few years ago, the U.S. Supreme Court said that "community standards" should be used in evaluating whether the content of materials is unsuitable. This was easy to do — at least in theory — when the material in question was a magazine at the corner store. The community encompassed the area around the store out to some fuzzy boundary.

This is quite a bit harder to do when the community is electronic and extends from McMurdo Sound to Los Angeles and from Helsinki to Johannesburg. Material considered tame in one location could be deeply offensive or even illegal in another. While the first thing that may come to mind is raised is sexually explicit words and pictures, it is also easy to run afoul of political or religious sensibilities.

Many agencies — governmental and otherwise — are trying to deal with these content issues. I'm told there are governments that want to control all data traffic into their countries and plan to install gateways on all of their Internet connections to make this possible.

The latest organization to try and get into this arena is Carnegie Mellon University, which last month shut down some Usenet newsgroups due to fears that the university might be prosecuted under one or more Pennsylvania obscenity statutes.

It is part of the function of a university to act *in loco parentis* for its underage students, but the move to censor, in addition to being futile, might have opened the university to more liability than if it had not acted.

There is an old saying (well, old relative to the Internet): "The 'Net sees censorship as a fault and routes around it." Unless CMU were to cut off all connections to the rest of the Internet, there is no way to prevent CMU students, faculty and staff from obtaining the specific material that the university is trying to block. There are open news servers and FTP sites (please don't ask me for pointers, I will not respond) where it can be accessed, or it could just be sent through E-mail by a collaborator at some less authoritarian institution.

In addition to being unable to actually block access, once CMU undertakes policing the content of the information available to university students, the students' parents may come to expect the school to be successful in doing so. According to some lawyers, failure to do a complete job actually exposes the organization to a higher liability than had it not started policing in the first place.

In the face of strong criticism, CMU is now starting to back down and has already enabled those newsgroups that do not normally contain graphical images. Note that articles are frequently cross-posted to multiple groups, so some images will likely creep in under the revised policy.

This type of censorship, in addition to being technically unfeasible, starts down that proverbial slippery slope that CMU is now trying to climb back up. I do not want to be seen as condoning this type of content, but the idea that content can be controlled is the antithesis of the Internet, and that is why the Internet is not welcome in the same places that try to regulate fax machines.

This is a conflict that will continue to accompany the growth in extent and use of the Internet.

Disclaimer: Harvard, like all Internet-connected organizations, will have to make its own choices in this arena. The above are my opinions only.

➻ Bradner is a consultant with Harvard University's Office of Information Technology. He can be reached via the Internet at sob@harvard.edu. He shares this space with Dan Minoli, whose column will appear next week.

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LEGENT joins Sun and Microsoft in marketing, development agreements

BY MARGARET DORNBUSCH

Herndon, Va.

LEGENT Corp. and Sun Microsystems Computer Corp. have joined forces to ensure compatibility between LEGENT's open systems management applications and Sun's Solaris operating system and SunNet Manager.

In separate announcements, LEGENT said it will adapt its applications to manage nets running Microsoft Corp.'s Windows NT 3.5 and introduced the fruits of a previously announced agreement with Hewlett-Packard Co.

The LEGENT-Sun deal is the first step in a wider Sun branding program that is expected to be announced in 1995, a Sun spokesman said. The program is designed to assure customers that management applications from companies such as LEGENT are compatible with SunNet Manager, according to Rod Tansimore, a marketing development manager for Sun.

As a Sun Microsystems Premier Developer, LEGENT will have closer ties to Sun's marketing and development organizations, according to Joel Moss, LEGENT's vice president of market development. LEGENT and Sun salespeople will make joint sales calls in certain markets to sell Sun and LEGENT management packages.

LEGENT developers will get earlier access to new Sun equipment and software, Moss said.

Sun is experimenting with a specialized logo that will indicate the approved third-party products work not only with Sun management applications, but with other third-party applications, as well, said Steve O'Brien, a Sun market development manager.

Other partners will be announced when the program's final details are completed, he added.

Among the LEGENT products currently supporting the Solaris operating system are AgentWorlds agent technology; Paradigm/XP for problem management; Prevail/XP for job scheduling and automation; LDM/XP for replicating mainframe-based data to client/server environments; and Paramount/XP for enterprise resource management.

LEGENT is best known for its management products in the mainframe market, but over the past year, it has branched out into the Unix open systems market, Moss said. The partnership with Sun will strengthen LEGENT's position in that market. LEGENT has a similar relationship with HP that was announced in January, he added.

LEGENT products for HP OpenView

Product	Starting price	Availability
Prevail/XP-Automation Point	$3,000	December
Prevail/XP-Automation Point AS/400 Manager	$2,000	Now
Prevail/XP-Jobtrac Remote	$41,200	December
Prevail/XP-View	$16,100	Now
Prevail/XP-Spool	$26,600	Now
Prevail/XP-Deliver	$70,200	Now
Prevail/XP-Connect	$5,000	Now

That alliance resulted in seven LEGENT products announced this week that work with the HP OpenView management platform. The products include:

- Prevail/XP-Automation Point, which provides a single point of control for automation activity; and Prevail/XP-Automation Point Application System/400 Manager, which can monitor and automate alerts from multiple AS/400 systems.
- Prevail/XP-View, Prevail/XP-Deliver and Prevail/XP-Spool, which work together to provide on-line automated report distribution, on-line document viewing and remote printing.
- Prevail/XP-Connect, which allows mainframe-to-LAN print file transfer.
- Prevail/XP-Jobtrac Remote, which provides a consolidated view and control of scheduled events across multiple systems.

The Sun-Microsoft partnership, meanwhile, gives LEGENT access to advanced technical information and development resources. The company also becomes a member of Microsoft's Solutions Provider Program and receives technical and marketing support for Win32.

LEGENT currently supports Windows NT with products such as Paramount, a resource management product; Northwoods, an application development environment for creating employee performance systems; and Phoenix, a computer-based training program.

More than 20 LEGENT applications are scheduled to support Windows NT and Windows 95 in 1995, including Prevail, an automation management program, and Enterprise Storage Manager, a storage management program.

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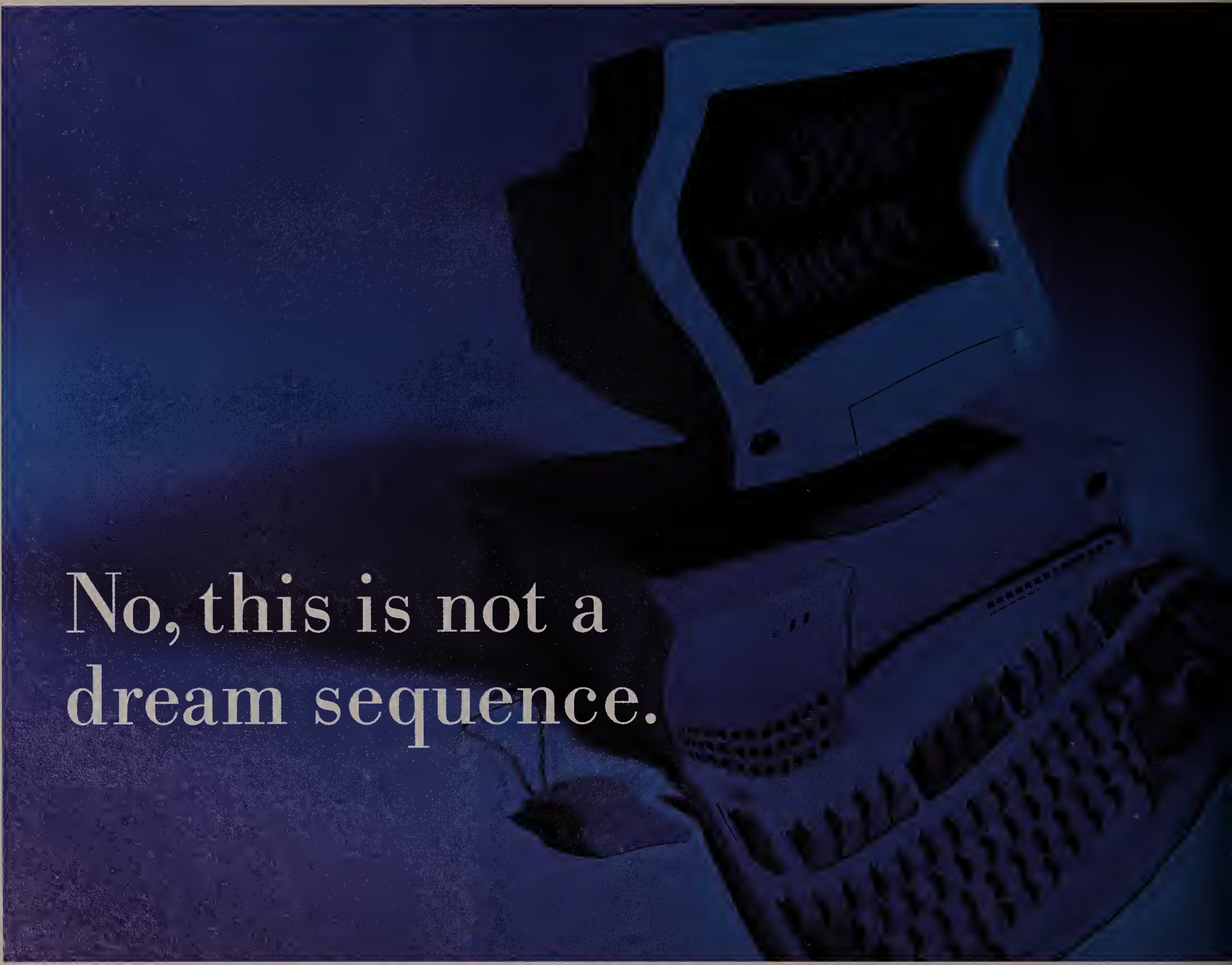

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Digital ports its PolyCenter NetView to Windows NT

BY MARTIN LaMONICA

Las Vegas

Managers of Windows NT servers gained a tested platform to get a grip on their networked personal computers with Digital Equipment Corp.'s announcement that it will port its net management platform, PolyCenter Manager on NetView, to Windows NT on its Alpha RISC processor.

At the Comdex/Fall '94 show here, Digital also said it will provide an extension to Microsoft Corp.'s Systems Management Server (SMS) that allows Windows NT users to monitor Unix and Open VMS systems with SMS. The new product, dubbed AssetWorks, provides a hook between Microsoft's SMS and the network management functions on PolyCenter NetView, officials said.

"Today's announcement will bring Windows NT into the enterprise management arena," said Enrico Pesatori, Digital's vice president of worldwide sales and marketing. "The goal is to work closely with Windows NT to make it a leader on the Alpha platform."

In December, Digital expects to release to members of the NetView Association a software developers' kit that will allow them to port their existing Unix and OpenVMS PolyCenter NetView applications to Windows NT.

At Comdex, 21 third-party developers voiced their intention to offer their applications on Simple Network Management Protocol-based PolyCenter Manager on NetView for Windows NT.

At the show, Digital officials demonstrated AssetWorks, which provides essentially the same network asset management and inventory functions for Unix and OpenVMS systems that SMS does for PCs. The application can distribute software and take inventory on SunOS, Solaris, AIX, HP-UX, and Digital's OSF/1, Ultrix and OpenVMS machines.

The application provides icons representing different system resources that administrators can drag and drop to get inventory information and asset properties or to distribute software, Digital officials said.

Digital chose to use the Windows 95 interface, including wizards, tool tips and movable tool bars, because of its improvements over Windows NT. The application will be released next month, officials said.

A key feature of AssetWorks is that it will interoperate with PolyCenter NetView so system administrators can use the network management and surveillance in its control desk. Adding network activity information, such as a failed router, to the systems management platform of SMS will be a big help in pinpointing problems.

"Network management problems can cause systems management [errors] and vice versa, which is why we created the integration between the two," explained Jeffery Snover, the PolyCenter technical director at Digital.

Digital: (508) 493-5111.

> **"Today's announcement will bring Windows NT into the enterprise management arena."**

➾ LaMonica is a correspondent with IDG News Service.

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ACC contributes monthly to the African Wildlife Foundation for the preservation of the elephant and its habitat.

INTERNET *tip*

BY ADAM GAFFIN

One in a series of occasional tips on Internet-based information services.

OS/2 outlook

The Massachusetts Institute of Technology OS/2 Users Group has set up a WWW server about the IBM operating system. Resources include:

- ✔ **Systems and networking tips**
- ✔ **Answers to frequently asked OS/2 questions**
- ✔ **Links to OS/2 software archives**

To access: Point your WWW browser at **http://www.mit.edu:8001/activities/os2/ os2world.html**

Gaffin can be reached via the Internet at agaffin@world.std.com.

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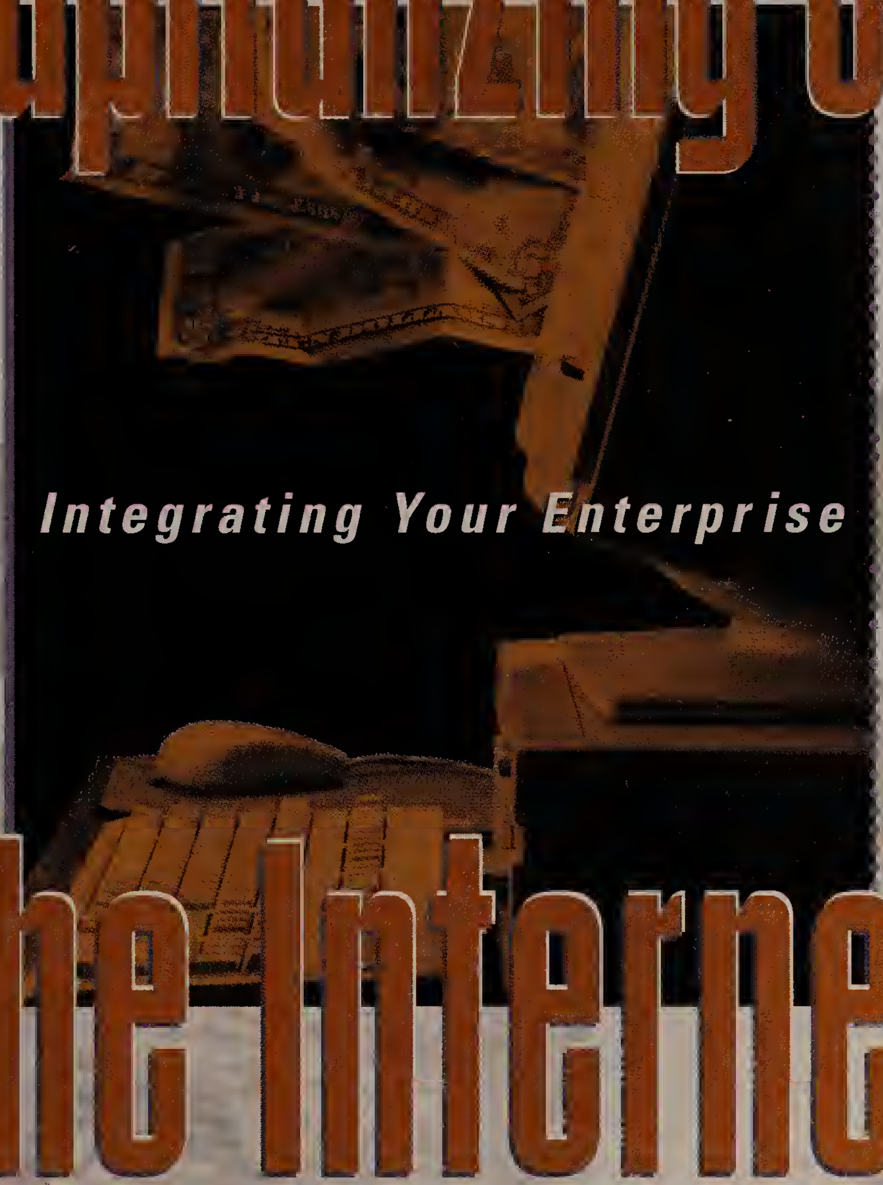

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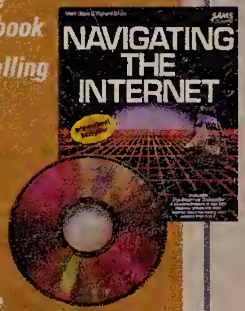

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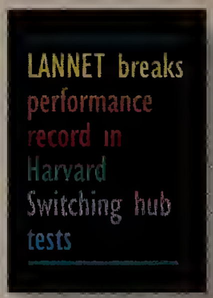

LANNET breaks performance record in Harvard Switching hub tests

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BRIEFS

Cheyenne Software, Inc. has released a version of its ARCserve backup software for Windows NT servers. **ARCserve for Windows NT** provides support for three levels of data verification, offers session password protection and features network and file security.

In addition, Cheyenne will make available throughout 1995 optional database agents for the product, enabling on-line backup of database servers such as those from Oracle Corp. and Sybase, Inc.

ARCserve for Windows NT will cost $895 and be available by year end.

Cheyenne: (800) 243-9462.

Concord Communications, Inc. has released two new network data retrieval applications for its **TRAKKER network management software**. Concord's Universal Poller uses Simple Network Management Protocol requests to extract network data from hub Management Information Bases (MIB) and remote network monitoring agents to extend data sources available to TRAKKER.

The other new application, Network Health, can use Universal Poller's data to help users identify and resolve potential network trouble spots before they become critical.

Universal Poller is priced at $7,495 for a 50-segment license, while Network Health is tagged at $12,495.

Both will be available in December.

Concord: (508) 460-4646.

Optical Data Systems, Inc. (ODS), based in Dallas, recently announced a new generation of **Fiber Distributed Data Interface modules** for its Infinity line of intelligent hubs.

The new modules support four independent dual-attached FDDI rings for an aggregate throughput of 400M bit/sec. In addition, the modules will enable ODS users to more than double the maximum number of FDDI users per chassis from 60 to 132. The new modules also offer advanced FDDI feature, including monitors, on a per-port basis.

Pricing for 12 unshielded twisted-pair ports is $9,795, and advanced FDDI capabilities cost an additional $6,200. Twelve fiber-optic ports cost $17,995, with advanced capabilities adding another $6,000. One- and six-port modules are also available.

All modules are available now.

ODS: (214) 234-6400.

Cogent Data Technologies, Inc., based in Friday Harbor, Wash., recently announced a **four-channel fast Ethernet adapter** for peripheral component interconnect (PCI) servers.

The addition to Cogent's eMaster+ fast Ethernet series of networking products, the Quartet/400 can support as many as four network segments on separate channels, with cumulative throughput of up to 800M bit/sec.

Quartet/400 uses an on-board bridge to minimize the load on the PCI bus.

Cogent's Quartet/400 will be available next month for $1,395.

Cogent: (206) 603-0333.

Consortium zeros in on desktop management

Chair says DMTF can survive Microsoft's rebuff.

Q&A The Desktop Management Task Force (DMTF), formed to establish personal computer management information standards, was dealt a blow recently when Microsoft Corp. — one of the group's founders — decided to withdraw support from parts of the DTMF's Desktop Management Interface (DMI) (*NW*, Nov. 21, page 1).

But according to DMTF Chairwoman Shannon Voigt-Gray of Intel Corp., Microsoft's decision to build its own PC management application program interface for Windows 95 will not delay the DMTF's goals. *Network World* Staff Writer Margaret Dornbusch spoke with Voigt-Gray about the Microsoft issue as well as the DMTF's other challenges and goals.

How did the DMTF get its start?

DMTF was started over two years ago as a result of many [vendors] getting the same feedback from corporate customers: The customers were deploying more PCs every day, but as they put them on the network, it created a management nightmare.

As [vendor] companies started sharing their feedback, they realized they were all up against the same challenge.

They decided to solve it from an industry standard point of view and not compete on how you get information and what the information is, but on how you display it and how you provide customers with really useful applications.

What are the key network resources the DMI will help manage?

The DMI will manage anything from servers to the desktop itself and any add-ins: a printer, a CD-ROM, a [Small Computer System Interface] drive. Where we draw the line is at the network infrastructure. Simple Network Management Protocol is already very well established in the internet environment.

How will Microsoft's decision to use only a part of the DMI affect the task force's plans?

We've gotten support from almost all the key operating system and network operating system vendors. It is a significant accomplishment for these vendors to allow a standard to drive a key part of their operating system as well as their manageability and device driver models. Having Microsoft support the DMI and all the standard [Management Information Files or MIFs], and to be a key contributor to DMTF, is still significant.

See Desktop mgmt., *page 28*

IBM vs. Microsoft: battle of the operating systems

BY PEGGY WATT

Las Vegas

Silverberg

"Windows 95 has all the plumbing for Internet access, including [WinSock] API."

"Five thousand people signed up for Internet access" during the first full week of OS/2 Warp's release.

Casey

The Comdex/Fall shows of years past saw the introduction of Windows and a joint IBM-Microsoft Corp. OS/2, many strange partnerships and ferocious competition. The most recent edition of Comdex, the annual computer industry convergence here, saw a renewed desert battle of operating systems.

IBM representatives in polo shirts exhorted users to "get warped" with its newest version of OS/2. Microsoft took a three-prong approach, showing its just-shipped Windows NT and its beta version of Windows 95, as well as dropping hints about Cairo, the successor to Windows NT that one analyst dubbed Windows 96.

Users eager for Windows 95 will get a copy soon, although Microsoft still projects a spring shipment. The company plans an essentially open beta program when it releases beta-Version 3, expected in early 1995. Beta 2 is being distributed now.

See OS battle, *page 28*

Dow Jones brings video to the desktop

BY TORSTEN BUSSE

Soon, money managers will be able to see video clips of breaking news events on their PCs, enabling the managers to react swiftly to the effect such events have on investments in the world's stock exchanges.

Dow Jones Multimedia Division is beta-testing a switched Ethernet network designed to deliver such video feeds to its customers, which include brokerage firms, mutual fund managers and others.

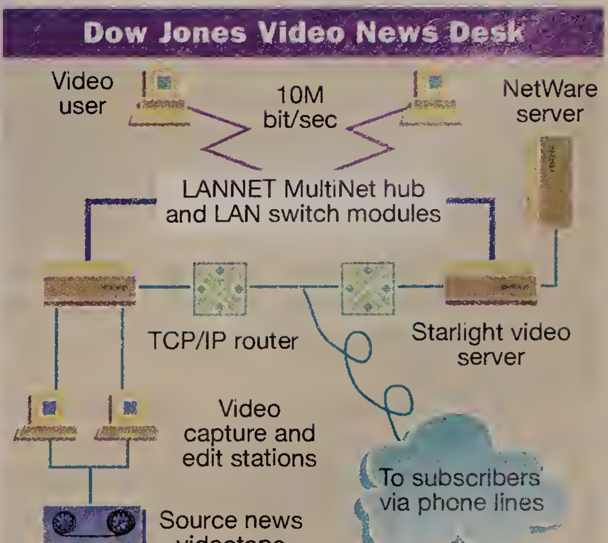
The Dow Jones Video News Desk network was designed by the company from scratch and will be in full production next year, said Sean Milligan, a technical specialist at Dow Jones. The net is based on a switched Ethernet topology and relies on LANNET, Inc.'s MultiNet hubs and Starlight Networks, Inc.'s StarWorks video server.

The video feeds are recorded by the Dow Jones Investors Network, an analog video service the company also operates. Editors at the Dow Jones division then take the analog video pictures and digitize, edit and compress them.

Over a Novell, Inc. NetWare 3.12 Ethernet LAN, the compressed video is sent through LANNET's MultiNet LET-36 hub via 10M bit/sec Ethernet pipes to the StarWorks video server. Possible text or graphics files included in videos are stored on a NetWare server, Milligan said. The videos and graphics can then be accessed by Dow Jones users.

Via simple file transfer, the video

See Dow Jones, *page 28*


Dow Jones Video News Desk

Video user
10M bit/sec
NetWare server
LANNET MultiNet hub and LAN switch modules
TCP/IP router
Starlight video server
Video capture and edit stations
Source news videotape
To subscribers via phone lines

Source news video is edited, digitized and turned into files in the Starlight video servers. The files can be accessed locally via switched Ethernet or by Dow Jones customers via a local carrier.

Windows Connectivity Forum

Hot topics: From Sybase to Windows-based faxing

Here's a few Thanksgiving week leftovers for you from discussions on the Windows Connectivity Forum (WINCON).

◆◆◆

On Sybase, Inc's acquisition of Powersoft Corp., a leading Windows-based application development tool supplier, one forum member wrote: "I expect the new company now to be in position to consider [making] a play for Borland [International, Inc.] either for the languages division, Interbase or possibly the entire company."

◆◆◆

About Windows NT Advanced Server hardware drivers, a user placed this plea on the forum: "I just installed [Windows for Workgroups] 3.11 on a Dell [Computer] P90 with a [Standard Microsystems Corp.] Ultra 10B-T card. Windows locks us at the Banner screen. If I Rem out the IFSHLP.SYS in the config.sys or do a WIN/N, WFW works fine, but no network. We are connected via a twisted pair to a SynOptics [Communications, Inc.] 3000 hub. Is there a bug with that .sys driver?"

By Joel Diamond
Technical director

WUGNET
Windows User Group Network
76702.1023@CompuServe.com

Windows User Network (WUGNET) WINCON Technical Sysop Bob Chronister suggests getting at the new drivers directly from SMC Ultra 10B-T. After the installation of the new drivers, we suggest that you use a double terminator on your network box.

◆◆◆

Some users are perturbed about Microsoft Corp.'s lack of Microsoft at Work Fax support in the Windows NT 3.5 Workstation edition. Microsoft Solution Provider Jim Blakely (74774,556) of Blakely Signature Associates responded as follows:

"Actually, there's nothing puzzling at all about Microsoft not including fax support in Windows NT 3.5. Among the reasons why:

- Most client machines run WFW, not Windows NT.
- Microsoft at Work Fax was first included in Microsoft Mail, which is available in WFW. But Microsoft is revamping its entire Microsoft Mail product line, so the Microsoft at Work PC Fax technology included in WFW is only a temporary implementation. Microsoft Mail, and its Microsoft at Work PC Fax implementation, just were not ready to be included in Windows NT 3.5.

ANOTHER INTERNET DISCOVERY

Following up last week's column on Windows-based Internet tools (NW, Nov. 21, page 30), here's another interesting technology for my WinSock-based Internet configurations.

Now available on the WINCON WinSock Library 10, WinRSH Remote Shell for Windows 1.6 contains a very simple user interface to allow a Windows user to run a program remotely on another TCP/IP-connected computer over the Internet. The software takes advantage of Unix-based facilities, including the RSH daemon and the REXEC daemon.

A user could employ the software to remotely do print jobs, back up files and handle other tasks. The results of the remote execution are displayed in a scrollable window on the user's workstation.

The file contains the C++ source code and is released under a GNU license. For more information, contact William K. W. Cheung via electronic mail at: wcheungee@ubc.ca.

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To participate on the Windows Connectivity Forum, type **Go Wincon** at any **!** prompt on CompuServe. For those of you who are not CompuServe subscribers, *Network World* and the Windows Users Group Network are offering a free membership signup by calling (800) 524-3388. Ask for Operator 426.

Desktop mgmt.

Continued from page 27

The biggest area where we'll need to work with Microsoft is on the behavior of their DMI Service Layer in Windows 95. We need to make sure it is equivalent to a Service Layer in Windows 3.1 and that any of the data that could be communicated through the DMI to an application is going to have the same value in Windows 95. I think they're open to working with us on that.

DMI is not totally compatible with SNMP. How will the DMTF work around the fact that you will have to have both an SNMP management system and a DMI system?

What DMTF has done is provide a tool called MIF to [Management Information Base or MIB]. Anybody who has developed a standard MIF or a proprietary MIF can take this tool and translate it to [an SNMP] MIB format. Novell has written some glue code for its NetWare Management System SNMP agent that talks to the DMI service layer.

We need other SNMP-based management console vendors to do the same thing.

What is DMTF doing to get user input into its work?

Users were the catalyst for the whole task force and technology development effort. For the past year and a half, we've really had our heads down, developing the specifications. Now that those are finalized, we are interested in getting feedback on the standard MIFs. We've formed a DMTF corporate user advisory council to give feedback on the standards committees' work, to act as evangelists for DMTF and show other users how this is the opportunity to make a difference in the types of products they get — to require DMI as a check-off for any products they purchase in '95.

You've already issued PC systems and adapter specs. What is the time frame on the remaining specs?

The printer and software applications working committees have draft specification that will be finalized this quarter. The servers working committee is looking at a second-quarter 1995 delivery. We're also starting to launch some different working committees [on such topics as] modems, sound cards and PC telephony services. With PCs, servers, software, NICs and printers, we're well on our way to getting some of the key devices that people need to manage. ◪

Dow Jones

Continued from page 27

clips are also sent to a local phone company, which provides video storage. The telephone company, in turn, distributes the videos over T-1 lines to Video News Desk beta testers — four Wall Street firms that Milligan declined to identify.

These beta sites — like the Dow Jones office itself — are equipped with a NetWare 3.12 LAN, StarWorks video servers and LANNET hubs. Beta sites have local storage capacity for five days of video material, Milligan said.

The beta testers have access to the video feeds from their desktop personal computers via a Windows application designed by Dow Jones. The minimum configuration of the desktop PC calls for a 33-MHz 486-based computer with a minimum of 8M bytes of random-access memeory, a video playback and sound card, as well as a network interface card.

Given that traditional Ethernet provides a shared 10M bit/sec pipe, Dow Jones needed something more powerful for its bandwidth-intensive video application, according to Milligan.

"Switching at the [customer] sites is not important, but it comes into play here at our offices," he said. Dow Jones is only supporting as many as six simultaneous users per each customer beta site, Milligan added.

LANNET's $16,703 MultiNet LET-36 hub features a 1.28G bit/sec cell switching backplane and accepts a variety of multiport Ethernet switching modules to establish point-to-point connections between any two network ports on demand. Not only does the switching provide bandwidth on demand, it also reduces Ethernet collisions.

Dow Jones is using Version 1.7 of Starlight's StarWorks video server, which supports 50M bit/sec or as many as 40 simultaneous users viewing videostreams on DOS, Windows, Macintosh or Sun Solaris workstations.

It remains to be seen if the current Video News Desk network configuration will be offered to Dow Jones' customers, Milligan said. Beta tests are to be concluded by year end.

Dow Jones has yet to decide how the service will be priced.

➜ Busse is the Munich correspondent for IDG News Service.

OS battle

Continued from page 27

"[Beta 3] will be a pretty complete version. A few things may be added or changed for the shipping version," said Rogers Weed, group manager of the personal operating systems division. Users will be able to get a preview release of Windows 95 for about $30.

Microsoft officials also spent some time in the Comdex spotlight trying to differentiate among its operating systems for sometimes puzzled attendees.

Microsoft sees Windows NT as more robust and better suited for mission-critical applications than Windows 95, said Brad Silverberg, Microsoft senior vice president.

He said Windows 95 will run most Windows 3.1 applications unchanged, although Microsoft is urging software developers to revise their applications for the new version. Some tools and utilities that access internal operating system files won't be able to run on Windows 95, he added. Also, Microsoft will continue to support Windows 3.1 after Windows 95's release, although officials would not say for how long.

Microsoft is sticking to a 1996 release date for Cairo, said Mike Maples, the firm's vice president of products. The company expects to begin testing Cairo late next year.

Microsoft is porting all of its desktop applications to Windows 95, said Liz King, the company's director of corporate marketing. But Windows 95 is not strictly a desktop system; besides such communications features as a shell to the company's new on-line service, Microsoft Network, the product contains stacks for TCP/IP, Network Basic I/O System, IPX/SPX and the Point-to-Point Protocol.

IBM officials promoting their just-shipped OS/2 update, which also provides such connectivity features as an Internet shell and support for TCP/IP, token ring and general dial-up communications, suggested that Microsoft beef up Windows 95's communications features after seeing OS/2 Warp.

Warp features built-in access to the IBM Global Network and easy registration to the Internet, as well, said Walter Casey, IBM's director of marketing for personal software products. Through the Global Network, IBM will register Warp users and provide tips and minor updates. IBM is inviting OS/2 application developers to reach customers by putting sample versions of their programs on IBM's service.

IBM's next iteration of OS/2 enters beta test in December, Casey said. It is a repackaging, rather than a new version. Known by the working title OS/2 LAN Client, the package includes Warp; a TCP/IP stack; requesters for LAN Server, Novell, Inc. NetWare and IBM's LAN Distance remote access software; as well as the client portion of IBM's System Performance Monitor.

Despite OS/2's capabilities, IBM positions LAN Server as its primary network operating system, said Philip Powers, marketing director for LAN systems in IBM's personal software products division.

Despite their renewed competition, Microsoft and IBM's Intel Corp.-based operating systems are linked in the past and future. The currently shipping version of OS/2 assumes that the user's system has both DOS and Windows installed, and takes advantage of their presence to ensure application compatibility. A version will ship by year end for computers that do not already have DOS and Windows installed, however, IBM officials said. ◪

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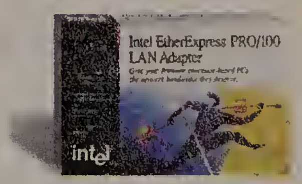

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NET RESULTS

by Mark Gibbs

Networking theory competition results

Well, the inaugural *Network World* Theory Competition (Oct. 3, page 34) has generated a deluge of submissions featuring exquisite and elaborate hypothecation and extrapolation.

In short, the entrants made wild guesses and shot from the hip. But for a select few, their random aim paid off, and their deranged theories have earned a spot on the pages of this august organ.

While there were many entrants who deserved a mention, we only have space enough to insult a few of them.

Joe Kimmey wrote, "I've skipped your articles up to this point, but that won't happen again."While this would normally relegate his entry to the bit bucket, his concern for humanity made me reconsider.

Kimmey wrote: "My concern for the future of this great world is very acute, and to do my part, I've ordered a second hard disk drive for each of the PCs in my small but demanding realm of control. My plan is to mount the second drive above the original unit in an inverted position. This should cancel the spinning effect and possibly prevent the earth from careening out into space."

Nice try, but the "I've skipped" bit was a strategic error.

Our third place winner, Brian Sumner, offered a unique piece of lateral thinking that echoes the philosophies of Einstein, Kant and Madonna — but only if you have access to illegal substances.

Sumner penned this theory: "DOS/Windows-based IBM-compatible computers use either Expanded or Extended Memory for newer memory-hungry applications. As information in the memory of these computer systems is overwritten, it is released into the cyberspace black hole — 'Expended' Memory. This category of memory is composed of all of the old information space (real or virtual) that has ever been used on any IBM-compatible PC that operates using unreliable 16-bit operatting systems.

"This Expended Memory black hole has grown to alarming proportions and is in danger of growing to such size that it will begin pulling information from PCs into its gravitational field before users are prepared to release it!

"Our only hope for avoiding this horrible fate is for all PC users to convert to 32-bit, flat memory model-based operating systems — Unix, OS/2 and Windows NT come to mind. Conversion will prevent attainment of Expended Memory critical mass by eliminating DOS/Windows memory management kludges and reduce the size/force of the vortex, which is even now threatening our data."

In second place came David Schaffer of the curiously named organization There Must Be A Better Way. Schaffer's ramblings were perhaps the ones most relevant to the real world, but I decided that was no reason to ignore him.

He wrote, "Schaffer's Theory of Software Upgrades: If you succeed in getting more than 50% of your users on the current version of a product, an upgrade will immediately be released.

"Corollary 1: If you have fewer than 50% of your users on the current version when the new version is released, there will be a significant technical obstacle to skipping a version level.

"Corollary 2: If you upgrade for the sake of support of your newer hardware, the new version will not support all of your older hardware.

"Corollary 3: If you upgrade for the sake of new features, your existing hardware will not support the new software.

"Corollary 4: If you upgrade for added cross-platform support, you will lose backward-compatibility.

"Corollary 5: If you upgrade to escape bugs in the previous version, may I interest you in some waterfront property? Just come by at low tide."

Our grand winner is Belgarath the Sorcerer (a.k.a. Dave Bank) from the North Carolina

See **Gibbs**, *page 76*

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In Alaska, Hawaii and Canada	$250, plus $250 per DS0		$250
Per PVC	**CIR**	**Burst rate**	
In the continental U.S.	$17.50 per 8K bit/sec	$3 per 8K bit/sec	None
In Alaska, Hawaii and Canada	$125 per 8K bit/sec	$25 per 8K bit/sec	None
AutoReconfiguration			
Option (all sites)	$250 per port		$200 per port

GLS banks on carrier with a congestion mgmt. plan

BY JOANIE WEXLER

Chicago

After checking out the big-name carriers, GLS Corp. has settled on LCI International Worldwide Telecommunications for a new frame relay net largely on the strength of the carrier's bandwidth management plan.

GLS, a maker and distributor of industrial raw materials here, recently swapped out a 9.6K bit/sec leased-line terminal-to-host network for an 11-site frame relay net to connect newly installed Novell, Inc. NetWare LANs.

The leased-line net cost about $60,000 a year, and costs have stayed proportionally the same in the three-month life of GLS's new FramePlus network from LCI, said Bob Beaird, director of information systems at GLS.

LCI offers frame relay service in every local access and transport area in the U.S. and in 57 other countries. GLS also accepted bids from AT&T, MCI Communications Corp. and Sprint Corp.

GLS runs 56K bit/sec port speeds at all sites and 16K bit/sec permanent virtual circuits among the firm's 11 locations in the Midwest and Southeast.

EASY TO GRASP

The LCI pricing — which came in about 25% lower than high-bidder AT&T — was certainly a factor, Beaird said. But LCI's straightforward, understandable pricing system — an anomaly among frame relay service providers — and its bandwidth management plan played a large role in the decision, too.

LCI runs its network at 70% utilization, reserving 30% capacity for bursting, according to Scott Booth, director of LCI's data services division. He said LCI's scheme of having users sign up for increments of bursting capacity they expect to use during peak times allows LCI to plan its network capacity needs fairly close to the mark.

LCI intends to continue steadily building out the network as users are added to maintain the 70%-to-30% ratio, he said, and user "burst reservations" help LCI stay on top of the task.

The knowledge that potential congestion problems were being dealt with ahead of the game was important to GLS. "One of the difficulties I had in my discussions about bursting with vendors was that everybody had a slightly different definition of what a burst is," Beaird said.

"It was hard to pin down vendors as to what I could really expect to get" with bursting, he added.

To help manage its own network — and user expectations, as well — LCI charges a nominal monthly fee per site for the users' right to burst in 8K bit/sec increments if the capacity is available (see graphic).

That bandwidth is not guaranteed but is likely to be there since users have registered their probable burst speeds with LCI and have allowed LCI to plan accordingly, Booth said.

GLS, for example, has registered for 32K bit/sec of bursting capacity at each site — or an extra 16K bit/sec. At $3 per 8K bit/sec increment, this costs him $6 a site per month.

Beaird said he believes the price is worth allowing his carrier to better assure him that bandwidth will be available for those bursts.

A different carrier suggested Beaird go with a zero committed information rate — where all network usage is subject to capacity availability. "The rationale was that the bandwidth would 'just be available,' " he said.

That explanation didn't give Beaird a secure feeling about response times and potential retransmissions. "Maybe the capacity would be there today, but what about tomorrow?"

Beaird pointed to stories about users getting comfortable with a level of frame relay service from a given carrier, only to see their service degrade as more users are added to the network and congestion starts happening. ◪

Users warm to outsourcing

Relinquishing routine net functions makes option more palatable.

BY JOANIE WEXLER

Framingham, Mass.

The debate about whether businesses should bear the burden of being their own phone companies has accelerated with the advent of sophisticated services and support from carriers and others.

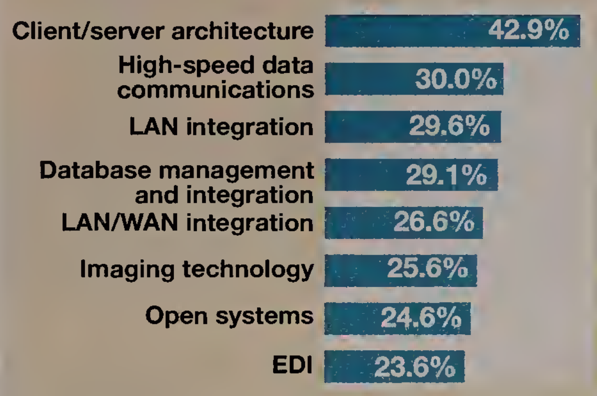
And given that information technology has long been described as key to business success, companies struggling to keep pace with new skill and resource demands may be finding themselves in a catch-22: They worry about trusting the network to an outsider but may not have the resource muscle to go it alone as technology changes at breakneck speeds.

A just-released study by Dataquest Worldwide Services Group, though, states that many firms are starting to find a happy medium by outsourcing niche functions to supplement their on-site staffs. This trend could cause outsourcing to explode over the next few years (see graphic, page 34).

One thing that eases users' minds with this approach is the dilution of the term "outsourcing," which used to imply the transfer of entire systems staffs to a vendor company, said Jeff Kaplan, a director at Dataquest and author of the report.

Outsourcing drivers

Top technology trends spurring the demand for outside services:



Based on a survey of 203 companies. Multiple responses allowed.

SOURCE: DATAQUEST, FRAMINGHAM, MASS.
GRAPHIC BY SUSAN J. CHAMPENY

Functions companies might choose to keep in-house include the development and maintenance of proprietary applications that are integral to the business — such as a yield management system for an airline. But outsourcing more routine tasks is generally becoming more palatable, according to the study's findings.

The Dataquest survey of about 200 companies shows that cost savings ranked third as drivers to outsourcing behind the need for new expertise and knowledge, and supplemental staff and resources.

However, one company heavily into outsourcing said users should expect to pay 5% to 20% less for outsourced data center and telecommunications services than they would if they held onto the functions.

The reasons are that vendors enjoy greater economies of scale and volume purchase discounts when serving multiple organizations' needs than a single company can possibly get on its own, said Alan Cranford, manager of systems operations at American Medical International, Inc. (AMI), a health care organization based in Dallas.

"As a rule, routine operations, such as data center functions, data communications and network management, can be easily outsourced," he said.

AMI outsources all its centralized mainframe data center and nationwide data communications functions to Perot Systems Corp. and retains a 15-person information systems staff for strategic planning, asset management and management of the outsourcing relationship, Cranford explained.

AMI falls under one of two trends identified by the Dataquest report, whereby the customer relinquishes responsibility for management of legacy systems and other more routine activities such as help desk functions. They do this because the risk is low, and the

See **Outsourcing**, *page 34*

BRIEFS

Saturn Global Network, Inc. has opened its first **North American office** in New York. The company, an international provider of voice, fax, low-speed and broadband digital data services, and Ethernet and token-ring LAN interconnect as well as frame relay access services, will now provide transatlantic services between the U.S. and Europe, Australia and Asia.

Saturn Global Network: (212) 385-7979.

AT&T has debuted a new **800 service** that lets senders of packages record personal greetings or instructions to recipients. Called AT&T Talking Package, it costs the sender $1 to $3 per package, with a minimum requirement of 500 packages per month, plus a onetime installation charge of $1,000 to $2,500. Businesses sending gifts, awards or products with clear usage or installation instructions could use the service for a personal touch, said Kathy Marsico, AT&T national marketing director for 800 business applications.

Southern New England Telephone Co. (SNET) signed a marketing agreement with **MFS Datanet, Inc.**, to market MFS Datanet's Asynchronous Transfer Mode, LAN interconnection and other services to business customers in Connecticut. SNET is the major local exchange carrier in Connecticut, a state with no Bell operating company.

Wynd Communications Corp. in San Luis Opispo, Calif., has introduced an integrated mobile messaging and information service called **WyndMail for Windows,** which combines wireless access to Internet electronic mail with the ability to merge computers, pagers and phone functions into an integrated messaging system. Wireless Telecom, Inc., a mobile products and services integrator, will market the Wynd products to resellers.

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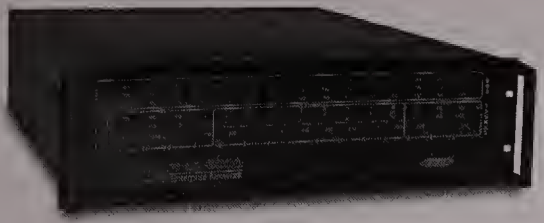

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Company ____________

Address ____________

City ____________ State ______ Zip ______

Telephone (   ) ____________

Protocols in use:

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- ☐ Bisynch
- ☐ Novell SPX/IPX
- ☐ Other ____________
- ☐ Asynch
- ☐ X.25
- ☐ TCP/IP
- ☐ NetBIOS

LAN topologies installed?

☐ Token Ring

☐ Ethernet ☐ Other ____________

Host system installed?

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RATE & TARIFF MONITOR

by Eric Paulak

NYNEX wants to be your only carrier

Telecom reform is coming, and the local exchange carriers (LEC) are getting worried.

Even without federal action, reform is coming at such a pace at the state level that the LECs are afraid they're going to be left out in the cold when their local monopolies are opened up to competition.

As a result, local carriers in states where regulators have already opened up portions of the local market to competition are coming up with promotions and special deals that offer some great local discounts. The only problem is that in order to get those discounts, you have to sign a long-term contract.

Take New York, for example. The biggest discount you used to be able to get with NYNEX's local service was 27% — but only if you committed to $3.15 million per year.

Now with its new Local Usage Discount Plan, you can get discounts of up to 70% off of your total local bill if you spent as little as $165,000 in the 12-month period that ended June 30. You can also get up to 10% off individual billed telephone numbers. Plus, NYNEX will give you a yearly credit worth 10% off your total local volume in the same period. If you spent the minimum of $165,000, that's a credit of $16,500 per year.

In return, you have to commit to something NYNEX wants more than a quick buck: a guaranteed buck for the next five years. Here's how it works.

Let's say you spent $165,000 on all your local traffic last year and committed to that same amount for the next five years. In addition to the 10% credit of $16,500, NYNEX will give you a 50% discount off all your local traffic above an 80% threshold — in this case, everything above $132,000.

Plus, for every basic telephone number that has a bill of more than $5,000 per month, you get a 6% discount. At $30,001, you get a 10% discount.

So if you committed to $165,000 per year for five years and had five billing numbers, one of which generated $6,000 per month in calls, you would pay standard local rates on four of the five numbers and get a 6% discount on the one number. And once you reached the 80% threshold of $132,000, you would get a 50% discount on usage for all your local traffic.

That's a pretty complicated way to get a discount, but there's a good reason — at least as far as NYNEX is concerned.

One of the requirements in the NYNEX tariff is that at least 80% of the total local traffic from that 12-month base period must be billed by NYNEX. If you already use NYNEX, the carrier just looks at your old bills. If you don't use NYNEX, you have to provide your bills.

So if you were considering a competitive access provider (CAP), such as Teleport Communications Group or Metropolitan Fiber Systems, you can only use them for a maximum of 20% of last year's traffic to still be eligible for NYNEX's Local Usage Discount Plan.

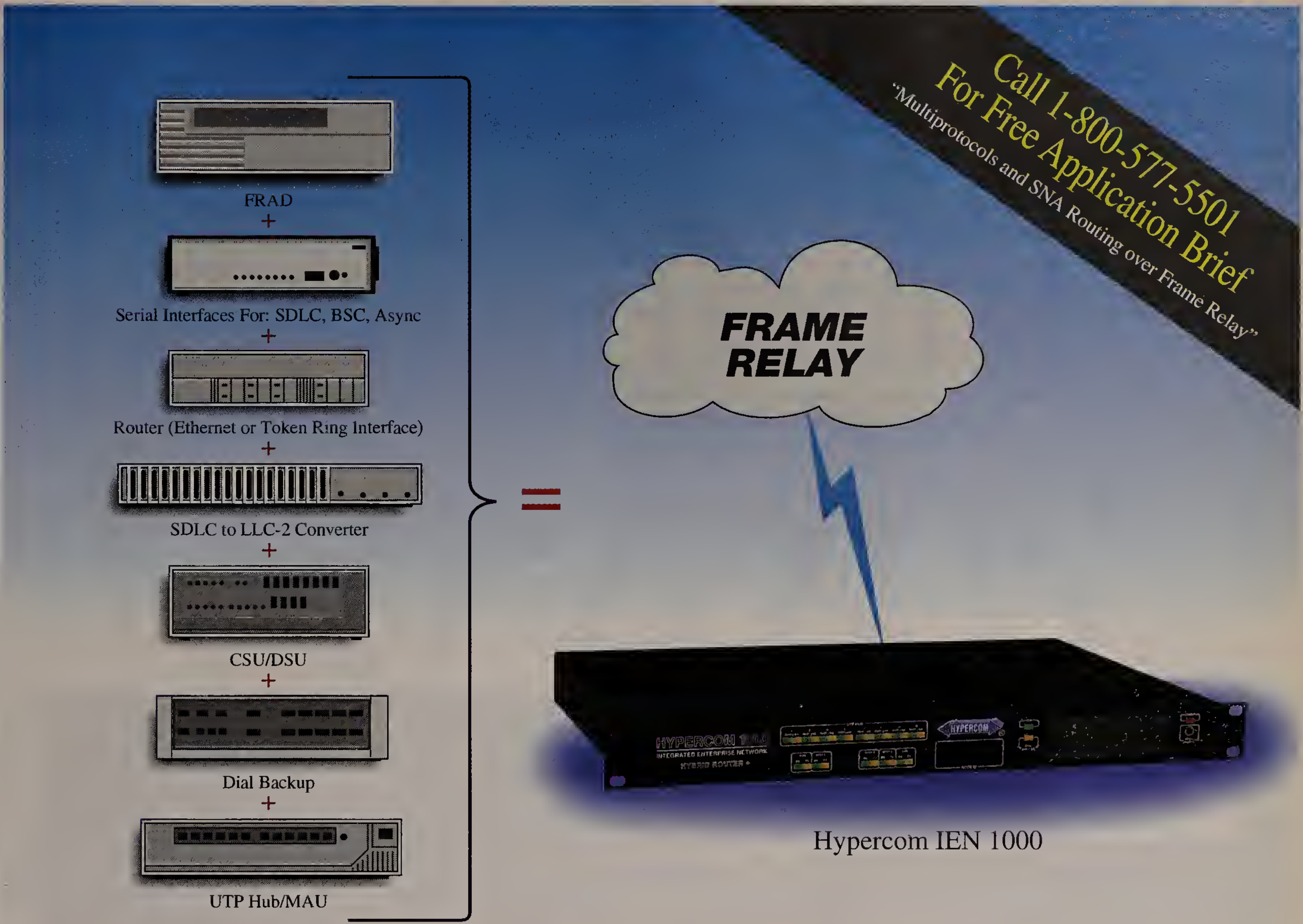
But because the largest discounts come only after you spend over that 80% threshold, if you use a CAP, you won't be taking advantage of NYNEX's best deal. That means if you want to save the maximum amount on your local service, you need to commit all your local volume to NYNEX for the next five years.

Why the big price breaks in exchange for longer commitments? Just as in Illinois, Maryland, Michigan and Wisconsin, an open regulatory climate in New York is helping the CAPs gain market share in the LECs' most lucrative market — business users.

By locking you in for the next five years, the LECs will be able to keep their market share — and, as a result, their revenues — up.

This means you should see more LECs offering bigger discounts for longer terms, at least until the LECs are let into the long-distance market, at which time the local market won't be as vital.

➾ Paulak is associate publisher for the Center for Communications Management Information in Rockville, Md., a provider of rate and tariff information. He can be reached at (301) 816-8950, Ext. 327.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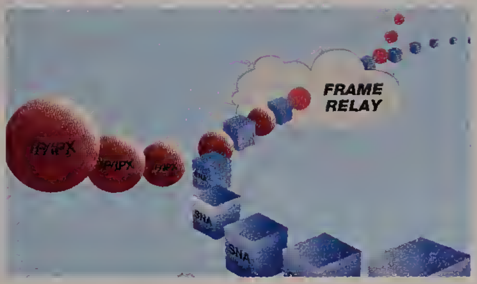
INSTANT BRANCH.

No one has offered a single vendor "plug-and-play" solution that replaces seven data communications functions with an integrated SNMP network management system...until now.

Data Comm MAGAZINE Hot Products

Introducing the Hypercom® IEN 1000, a complete "branch-in-a-box" system. Based on Hypercom's unique SNA/LAN consolidation technology, the IEN 1000 combines FRAD, Ethernet or Token Ring intelligent hub and router functions, legacy protocol support, DSU/CSU, dial backup modem, and SDLC to LLC-2 conversion in a single, compact, rack-mounted enclosure. In addition to improving reliability and maintenance, this single-device approach eliminates all interoperability and management issues encountered when using separate products from multiple vendors.



Hypercom provides consolidated frame relay networks.

The scalability of the IEN 1000 allows you to start with simple modules (FRAD for SNA) and add router or hub modules in the future.

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GLOBAL NETWORKS

WilTel drops int'l frame relay prices

BY DAVID ROHDE

Tulsa, Okla.

WilTel has unveiled two pricing initiatives that can cut costs for global frame relay users and reduce billing headaches for those with international private lines.

First, the carrier reduced most of its WilPak frame relay base rates for international permanent virtual circuits (PVC). The reductions were partly offset by a change in the way certain surcharges are assessed, with a net effect of slightly lower prices on PVCs between any two European nodes but dramatically lower prices for transoceanic links.

WilTel also announced a service to provide coordination of dedicated circuits between major financial and market centers. Under this plan, WilTel will take orders for overseas private lines, provision the circuits with international carriers and send a unified bill in U.S. dollars to the user.

The new frame relay pricing scheme retains a traditional WilTel notion that a WilTel customer can oversubscribe a node.

Under the old prices, 64K bit/sec ports in both London and Frankfurt, Germany, cost $2,430 per month each, assuming the user had a single 64K bit/sec committed information rate PVC between those two cities.

Under the new prices, the 64K bit/sec port in London costs $834, with the Frankfurt port priced at $909. The carrier will now tack on a $1,200 cross-border surcharge to pay for the expensive international transport costs within Europe, bringing the totals to $2,034 and $2,109, respectively. That's still lower than before, and the user can add PVCs for incremental amounts off the new, lower base-rate schedule with no increase in the surcharge.

MORE EFFICIENT

"This encourages customers to oversubscribe a node, which improves the average percentage port utilization," said Christine Heckart, a senior consultant with TeleChoice, Inc., a Verona, N.J., consultancy.

For links between the U.S. and Europe, the new price break is greater, since WilTel already tacked on a surcharge to cross continents. For example, 64K bit/sec ports in the U.S. now cost as little as $353 a month, with a $1,000 per month surcharge to cross the ocean to London. The net decrease is as much as two-thirds, depending on the options chosen.

Along with the new prices, WilTel turned up new Asian frame relay nodes to accompany its European and North American nodes. More expansion is due soon, including Paris next month and possibly Australia, Benelux and Singapore in 1995.

For international private-line customers, WilTel is pitching Complete Circuit Coordination, or WilNet 3C, under which it deals with foreign carriers on the U.S. customer's behalf and calculates a dollar-denominated bill.

To create the unified bill, WilTel will fix a conversion rate between any two currencies for 12 months, then bill in U.S. dollars, said French Scott, a WilTel product manager for international services.

The carrier will hit users opting for WilNet 3C with an additional charge "to recognize the fact that currency does go up and down," Scott said.

Nevertheless, Heckart said, this feature is "extremely important for a certain class of users" who do not ordinarily deal with foreign carriers.

The WilNet 3C service is available at DS1, fractional DS1 and DS0 speeds. Among the service options are diverse routing, signal formatting, voice compression and line coding. ☒

Outsourcing

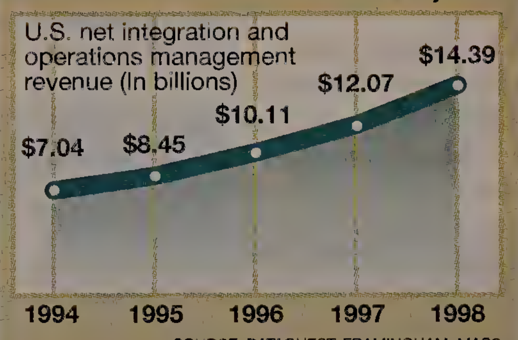
Continued from page 31

move frees up staff for more strategic business planning.

In the other scenario, the customer outsources application development and network integration on a short-term basis to avoid the cost of adding new personnel and training existing staff.

Cry for help

The amount companies spend on outsourcing is slated to double over the next five years.



SOURCE: DATAQUEST, FRAMINGHAM, MASS.
GRAPHIC BY SUSAN J. CHAMPENY

JOINING THE ACTION

New branches of outsourcing are now emerging, as well, from start-ups such as ACSYS Corp. based in Bedford, Mass., which will take over monitoring of LAN and desktop applications in remote sites (*NW*, Oct. 31, page 30).

This is something that AMI does not yet do but does not rule out.

"Remote LAN access outsourcing could make sense because it is difficult to get skills" in many diverse locations, Cranford said.

Other key findings in the Dataquest study include:

- Of the 200 firms surveyed, 14% surveyed had outsourced some aspect of their network operations in the past year.
- Of the customers who had not yet outsourced part of their network operations, 20% were likely to do so within the coming year.
- The adoption rate of remote network monitoring and management services is expected to grow from 3% of all commercial, governmental and academic organizations this year to 75% in 1998.

"Outsourcing no longer carries the stigma of a company on its deathbed," Cranford said. "There are healthy companies outsourcing." ☒

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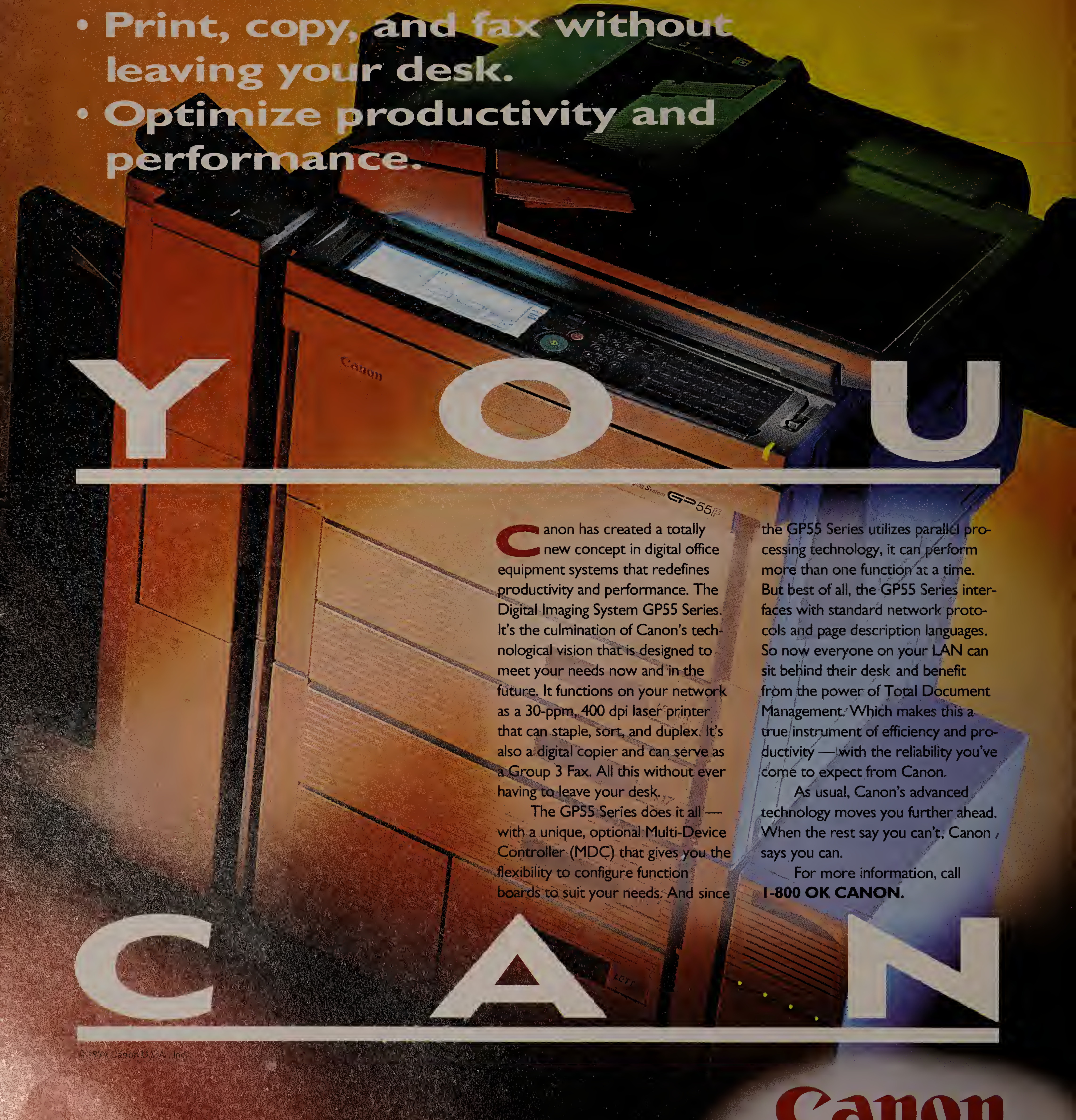

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BRIEFS

GroupQuest Software, Inc. of Los Angeles recently released enhanced software for administering **Lotus Development Corp. Notes** nets. Version 2.0a of the firm's Essential Tools lets an administrator remotely manage Notes server access control lists and user directories via a point-and-click graphical interface. It is available for Notes servers on OS/2; a Novell, Inc. NetWare Loadable Module version is planned for December. Pricing starts at $1,995 per server.

GroupQuest: (310) 201-0747.

FTP Software, Inc. of North Andover, Mass., last week announced it has added support for Microsoft Corp.'s Messaging Application Programming Interface (MAPI) to its Explore OnNet **Internet** client. Explore OnNet, which includes a World-Wide Web browser, gives Windows desktop users access to a suite of Internet services. MAPI support means users will be able to send mail to Internet addresses from within desktop applications. Pricing starts at $149.

FTP: (508) 685-4000.

Blueridge Technologies of Flint Hill, Va., has announced a Windows client for its **workflow** application, which previously supported only Macintosh clients. The Windows version of Optix Workflow features full interoperability with the Macintosh version. Both rely on Unix servers. Pricing starts at $75,000 for a site license.

Blueridge: (703) 675-3130.

AT&T Global Information Solutions has joined the Message Oriented Middleware Association (MOMA). The group, formed in July, is a collection of vendors, users and systems integrators seeking to develop interoperability specifications for **message-oriented middleware.**

MOMA: (415) 578-6996.

KnowledgeWare, Inc. of Atlanta, a computer-assisted software engineering market leader turned **client/server tool** vendor, is continuing its downward spiral, reporting a net loss of $15.8 million for the quarter ending Sept. 30. Revenue of $21.8 million for the quarter was down from $33.2 million for the same quarter the previous year. Company stockholders meet Nov. 30 to consider a takeover offer from Sterling Software, Inc.

Dun & Bradstreet Software of Atlanta recently announced a new version of its SmartStream suite of **client/server applications.** New to Version 3.0 are manufacturing and distribution modules and a development tool kit. Other modules, which include financials, received various enhancements. The software has Windows clients and supports a variety of Unix servers. Pricing for the tool kit starts at $20,000, and application modules start at $100,000.

D&B Software: (404) 239-2000.

Control Data aims at electronic commerce

Firm's MailHub X.400 and X.500 technology will provide service platform.

BY ADAM GAFFIN

Arden Hills, Minn.

Control Data Systems, Inc., the former mainframe maker turned systems integrator, thinks it has found a new niche as a provider of software and technical know-how for electronic commerce.

The company this week will launch an Electronic Commerce Solutions division that will build on Control Data's existing MailHub X.400 and X.500 electronic messaging product lines as well as its consulting experience in linking companies electronically. The goal is to offer customers packages that let them connect electronically with suppliers and vendors.

The evolution of Control Data

Before 1992	Provides mainframes.
1992	Begins new life as systems integrator.
1994	Becomes electronic commerce services vendor.

GRAPHIC BY TERRI MITCHELL

This will include helping customers set up such Internet-based services as World-Wide Web servers, said Jim Ousley, Control Data's president and chief executive offier. The company also hopes to make a big push into electronic data interchange and is looking to integrate its existing messaging products with a value-added network (VAN) to provide a range of electronic commerce services, he said.

Ousley said the new group will initially bring together existing Control Data units that today bring in about 25% of the company's $500 million in annual revenue. He predicted half the company's revenue will be generated by its electronic commerce business within a few years.

Key to the new business unit is the company's MailHub X.400 switch, which provides gateways between a variety of proprietary LAN- and host-based mail systems and can be used to build enterprise messaging backbones. The MailHub technology will be relied upon by Control Data to help connect trading partners across different messaging systems. MailHub's companion X.500 directory can serve in a similar capacity for linking disparate directory systems.

Control Data is in discussions with a VAN provider to integrate MailHub with VANs, but Ousley declined to name the provider.

Control Data will also push into the newer medium of the Internet, helping customers use the Web to provide everything from online catalogs to corporate information. The Web is a distributed Internet-based system of databases and documents connected via hyperlinks.

The firm is still evaluating the best ways to provide security for transactions over the global net, a key issue for companies considering doing business over the Internet.

CONTROL DATA'S THIRD WAVE

Control Data began life as a mainframe maker. But as minicomputers and then personal computers proliferated, the company began to hemorrhage money and in 1992 reorganized itself into a systems integrator committed to open systems.

Torrey Byles, director of the electronic commerce program for BIS Strategic Decisions, Inc., a Norwell, Mass., consulting firm, said Control Data could do well in its new effort to become an electronic commerce service provider. But the firm will face stiff competition by vendors like Hewlett-Packard Co. and Tandem Computers, Inc., both of which have similar high-end messaging divisions.

The new Control Data services should particularly appeal to companies that already serve as large information clearinghouses, such as credit card companies and bill processing centers, he said.

©Control Data: (612) 482-2100.

USER VIEW

Data warehouse aids hospital in doing healthy business

BY BARB COLE

Atlanta

Piedmont Hospital, a 500-bed facility here, has built a client/server data warehousing application that is helping it win business and cut costs.

The data warehouse stores financial data and patient information, and is used by some 40 hospital managers to determine the cost of treating patients and the effectiveness of those treatments.

The 20G-byte data warehouse is based on an Intel Corp. 486-based Compaq Computer Corp. server running a Novell, Inc. NetWare Loadable Module version of Sybase, Inc.'s SQL Server System 10 database. End users access the data warehouse via a Windows-based client application built with Information Builders, Inc.'s Focus development tool.

While a traditional database houses ever-changing information that is updated by a transaction processing system, a data warehouse contains static information that has been compiled elsewhere. End users access the warehouse information with decision support tools.

In Piedmont's case, financial information and patient data are still stored on separate mainframe-based systems. Each week, however, fresh data from those mainframes is automatically extracted and copied to the data warehouse, where it

See Hospital, *page 38*

KEYS to the MOVE

Building a better warehouse.

- ✓ Do a pilot or proof of concept before deploying the system.
- ✓ Benchmark the front-end development tool as well as the back-end database.
- ✓ Construct a meta model, which is a server-based set of rules that define who has access to the data and how data is loaded and translated into the warehouse.

Mark it down: Group calendaring spec now available

BY ADAM GAFFIN

The X.400 Application Program Interface Association (XAPIA) has released a new API that should make it easier for users to integrate network applications with group scheduling systems.

The Calendaring and Scheduling API provides a standardized way to link proprietary calendar applications with workflow, conferencing and other packages.

The API could profoundly change the way users interact with network applications, said Tom Austin, research director for the Gartner Group, a Stamford, Conn., consultancy. By linking the to-do and task-management functions of group calendar applications with those of workflow and groupware packages, developers could automate the process of routing information to the appropriate users and applications.

Austin said some companies might find this a more valuable way to deal with information overload than the universal in-boxes being developed by electronic mail vendors. E-mail vendors have yet to design powerful tools that would let users and applications prioritize and route incoming information, he said.

Calendaring vendors said they hope to add API support within a year.

See Calendaring, *page 38*

GROUPWARE

IBM launches new workgroup strategy

BY TORSTEN BUSSE
AND RON CONDON

Las Vegas

IBM has formally announced its move into the groupware market with a suite of object-oriented applications and tools aimed at spurring collaboration across an enterprise (*NW,* Oct. 31, page 2).

Offered under the umbrella name IBM WorkGroup, the product family includes a number of shipping and forthcoming messaging, workflow, database, data query and management tools intended to automate routine business procedures in small to large workgroup environments, company officials said.

The IBM WorkGroup family includes IBM's Ultimail and MQSeries messaging applications; FlowMark, the company's workflow management product; Visualizer, its data query and analysis tool; FormTalk, a forms routing and tracking software; Visual Document Library, a document management system; and a number of other products already available, said Richard Sullivan, director of IBM WorkGroup marketing.

IBM WorkGroup components

- Ultimail and MQSeries messaging
- FormTalk forms routing
- Visual Document Library
- FlowMark workflow

The new software is designed to work with IBM's mainframe-based OfficeVision messaging and group scheduling system.

NO COMPETITION

The WorkGroup family does not compete directly with any specific products but attempts to be a set of services that can work with other messaging, workflow and workgroup systems like Lotus Development Corp.'s Lotus Notes and cc:Mail, and Microsoft Corp.'s Microsoft Mail, IBM officials said.

"We are not there to compete with what is already out there," said Martin Smith, marketing manager for IBM WorkGroup communications.

Observers noted that IBM's strategy demonstrates the company's willingness to provide a framework for its own disparate line of products as well as existing third-party applications.

"They are taking advantage of what's out there and acting as systems integrator," said Sam Albert, president of Sam Albert Associates, a consulting firm based in Scarsdale, N.Y.

The WorkGroup family's underlying database technology will be IBM's DB2/2, Sullivan said. However, the WorkGroup systems will also integrate with relational databases from Informix Software, Inc., Sybase, Inc. and others.

IBM is beta-testing WorkGroup mail, messaging, scheduling, calendaring, fax and directory services based on OS/2, as well as the company's Time and Place application. Via folders on the OS/2 desktop, users will be able to access these services, send and receive text and audio messages, schedule meetings, and keep personal and enterprise-wide mail directories, Sullivan said. The communications facilities connect users across LANs and WANs, he said.

The IBM WorkGroup clients and servers will be available for OS/2, OS/2 Warp and Microsoft Windows 3.1 during the first half of 1995, followed by Macintosh, AIX, Windows 95 and various Unix versions at a later

See **Workgroup**, *page 42*

It's a bird, it's a plane...
no, it's IBM WorkGroup

by Mike Rothman

IBM has unveiled a new workgroup branding strategy, artfully dubbed IBM WorkGroup, to develop long-term synergies and integration between its diverse client/server workgroup offerings.

These offerings include messaging (Ultimail), calendaring (Time and Place), document management (VisualInfo and Visual Document Library), workflow (FlowMark), forms (FormTalk), agents (IntelliAgent), decision support (Visualizer) and fax. Eventually, you can expect the product names to go away, and each product will be referred to as a function of IBM WorkGroup.

IBM's premise is to attack the enterprise scalability requirement of workgroup applications, and that's a good idea. The company is also integrating and bringing some semblance of a common look and feel to its client-based workgroup product offerings, which is also good.

But this strategy is late, and IBM lacks credibility in the workgroup space due to its previous attempts in this market. The company needs to build mind-share fast.

Yet there is a stratum of society that wears blue underwear. Although it's not politically correct to be "true blue" anymore, they are out there and have been waiting for IBM to get its act together in the workgroup space for a long time.

Their savior has finally come — at least on the marketing slides — in the form of a caped crusader providing an enterprise scalable infrastructure for workgroup applications.

Assuming IBM delivers on its strategy in 1995, the true blues will be like pigs in slop.

To differentiate itself, IBM is using its MQSeries message-oriented middleware to ensure delivery of all messages through the WorkGroup infrastructure.

New management packages from the X.400 vendors as well as the emerging Mail and Directory Management Management Information Base should give net managers better control over message tracking, but MQSeries provides much more in terms of true asynchronous transaction processing. It's a logical path from store-and-forward, mail-enabled applications to distributed and scalable transaction-based applications.

Don't get me wrong, though. IBM WorkGroup has its share of warts. For example, IBM initially will focus on its own platforms — OS/2, AS/400 and, eventually, AIX — at the server.

No problem for the true blues. But this removes IBM WorkGroup from the mass market — which is largely running Novell, Inc. NetWare and will soon be running Windows NT — until mid-1996. IBM does not plan to support AIX on the back end under its WorkGroup strategy until mid-1995.

Hello, McFly? Users won't build their next-generation messaging infrastructure on an AS/400. AIX, sure, but no way on an AS/400.

Delivery timetables will also be an issue for IBM. The infrastructure products go into beta in January, but the specter of both Microsoft Exchange and Notes 4.0/Lotus Communications Server will weigh heavily on buying decisions in 1995.

The WorkGroup strategy would be a much more compelling story for IBM if general availability was in January.

Bottom Line: IBM WorkGroup will hit the true blue segment of the workgroup market by providing an allegedly enterprise scalable offering.

It has little mass market potential — unless Microsoft and Lotus fall on their own swords. But it will be successful in migrating staunch IBM shops off OfficeVision onto a more strategic workgroup platform.

Rothman is director of GNS Consulting for META Group, Inc., a consultancy in Reston, Va. Feedback is welcome either by E-mail at MikeR@metagroup.com or by phone at (800) 622-1108, Ext. 521. Rothman's column alternates in this space with that of Marc Myers, president of Client/Server Connection, Ltd.

Hospital

Continued from page 37

can be accessed by end users.

This data is key because Piedmont is increasingly being asked to bid for corporate accounts. In addition, department managers at the hospital use the data warehouse to ferret out doctors who are spending too much hospital money to deliver their services.

"One neurosurgeon was spending 20% to 30% more than his colleagues to perform operations. We tracked it down to the brand of supplies he was using in the operating room," said Jan Griffin, president and chief executive officer of Systems Techniques, Inc., the systems integrator that built Piedmont's warehouse.

Griffin said that kind of detailed information was completely inaccessible before the data warehouse existed. What's more, if two people went after the same information on the mainframe, they would invariably come up with different answers, she said.

SPEEDING THINGS UP

The server portion of the data warehouse will soon be moved to a Hewlett-Packard Co. HP 9000 Unix-based machine since queries on Compaq-based system can still take several minutes.

"It's better than waiting 30 days for a report from the mainframe system, but we need to move to Unix to get better performance," Griffin said.

Building a NetWare-based data warehouse for about $150,000 enabled the hospital to see the benefits of data warehousing before investing a huge amount of money, she said.

Calendaring

Continued from page 37

The XAPIA work comes in response to the same pressures felt by E-mail vendors a few years ago: Users are increasingly demanding links between proprietary applications.

Currently, each calendaring and scheduling application has its own way of storing and updating files and linking to other applications. Many have their own directories, causing potential headaches for managers, who find themselves dealing with both calendaring and E-mail directory maintenance.

The new API has three core functions: handling security and user identification; creating new calendars; adding, updating and deleting calendar entries.

A related API for linking disparate calendaring applications is due out in early 1995.

Austin said this API could prove particularly valuable for companies trying to link disparate LAN-based applications with each other and with the calendaring functions of mainframe-based applications, such as IBM's Professional Office System (PROFS).

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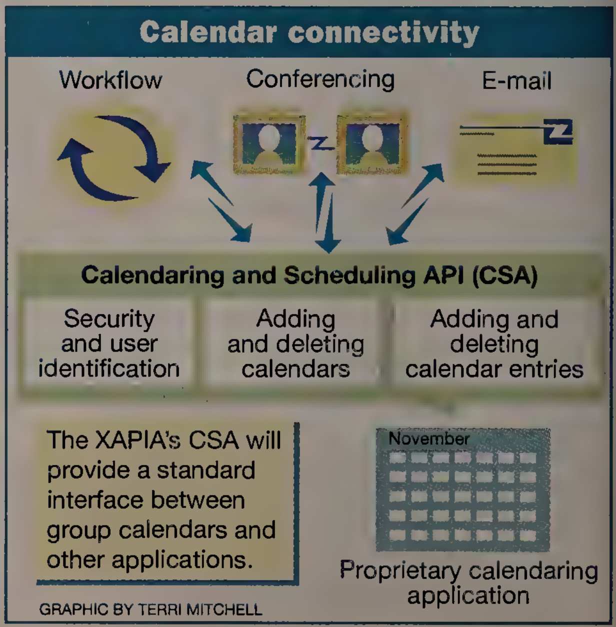
Calendar connectivity
Workflow
Conferencing
E-mail
Calendaring and Scheduling API (CSA)
Security and user identification
Adding and deleting calendars
Adding and deleting calendar entries
The XAPIA's CSA will provide a standard interface between group calendars and other applications.
November
Proprietary calendaring application

GRAPHIC BY TERRI MITCHELL

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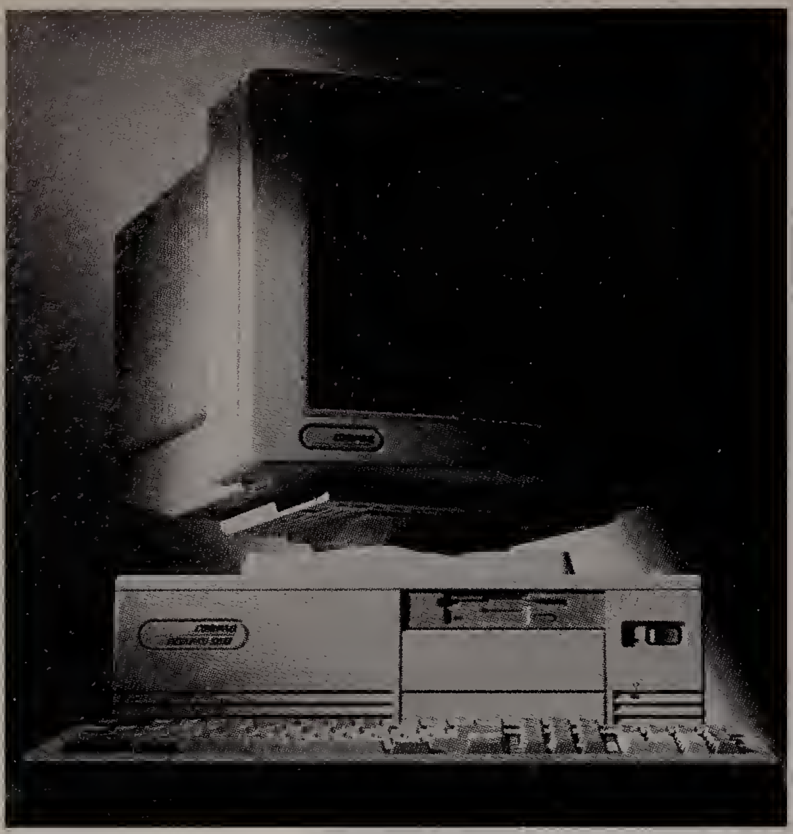

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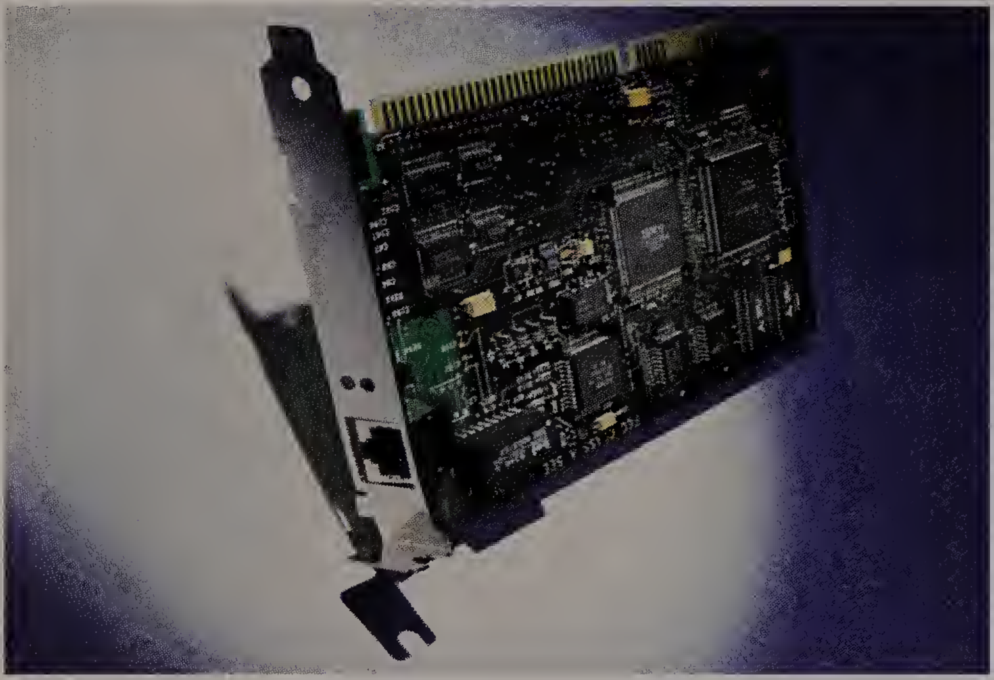

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Opening up OpenDoc to Windows

Novell readies Windows versions of OLE alternative.

BY BARB COLE

Las Vegas

Novell, Inc. is planning to port OpenDoc to Microsoft Corp.'s Windows 95 and Windows NT 3.5 operating systems as well as to roll out software that lets OpenDoc components work with Object Linking and Embedding (OLE) 2.0 objects.

WordPerfect, the Novell Applications Group, will release OpenDoc application development kits for Windows 95 and Windows NT 3.5 early next year. Those tool kits will be available around the same time WordPerfect's Windows 3.1 OpenDoc kit is ready.

WordPerfect, which sells many Windows-based applications, will make OpenDoc compatible with all future Windows versions, as well.

Apple Computer, Inc. and IBM — Novell OpenDoc partners — will take care of porting OpenDoc to the Macintosh operating system and IBM's operating systems, respectively.

OpenDoc, an alternative to Microsoft's OLE, splits software into pieces of reusable objects that developers can bolt together instead of writing custom code. OpenDoc will let users view and edit text, graphics and multimedia content within documents, without invoking separate applications.

OpenDoc is an effort of several companies, including Apple, Adobe Systems, Inc., IBM, Lotus Development Corp., Novell and the Object Management Group. They have formed Component Integration Laboratories, Inc. to oversee OpenDoc's evolution.

Early adopters of the technology were enthusiastic about Novell's commitment to port OpenDoc to future versions of Windows.

"This move is significant because if OpenDoc is going to succeed as a cross-platform development framework, it has to include Windows 95," said Gordon Leacock, systems research programmer at a large university in the Midwest. It is also key that all the Windows versions will be available at the same time, he said.

Windows 95 is the successor operating system to Windows 3.1 and is scheduled to roll out in the first quarter of 1995.

"Even though Windows 95 isn't out yet, that's where we're all heading. If OpenDoc is there, it will be much easier to sell management on the idea of using OpenDoc," said Michael Twisdale, object architect at Prodigy Services Corp. in White Plains, N.Y.

Nobody is interested in adopting an object standard that does not span several platforms, Twisdale said.

Included in the OpenDoc for Windows kits will be ComponentGlue Technology, which will "provide an easier application program interface for developers than OLE 2.0," according to Bill Kesselring, OpenDoc product manager for Novell.

OpenDoc does Windows

Novell will deliver OpenDoc on Microsoft Windows 95, Windows NT 3.5 and Windows 3.1.

▼

Novell promises OpenDoc will be compatible with all future versions of Windows.

▼

Developers will be able to program to OLE 2.0 with OpenDoc's APIs.

Twisdale, who has used both OLE 2.0 and OpenDoc, said the OpenDoc APIs will ease application development.

"I'm no wimp developer, but OLE 2.0 is hard," he said. "If OpenDoc is easier, why would I want to continue struggling?"

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Workgroup

Continued from page 38

date, company officials said.

The products will support industry standards including OpenDoc, Vendor Independent Messaging, Microsoft's Messaging Application Programming Interface along with others.

In addition, IBM WorkGroup will support the Simple Mail Transfer Protocol and Multipurpose Internet Mail Extensions protocols for TCP/IP Internet connectivity. The X.400 and X.500 messaging and directory standards will also be supported.

IBM has chosen the MQSeries messaging software to provide a backbone for enterprise communications.

To cater to multivendor environments, IBM has ported the software to the full range of its own systems, plus several flavors of Unix, Digital Equipment Corp.'s VMS and Tandem Computers, Inc.'s Guardian.

➠ Busse and Condon are correspondents for the IDG News Service.

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EDITORIAL INSIGHTS

Rethinking the user group

One of our features this week examines the health of network user groups, and the prognosis is disappointing (see page 55).

Budget and time constraints have eaten away at membership, and some premier groups are floundering. That's ironic, given the growing importance and visibility of networking, and discouraging when you consider just how much users can benefit from real networking — of the person-to-person type.

While it's easy to point a finger at the economy or blame corporate downsizing, user groups have to shoulder some responsibility for their decline. Some groups relied too heavily on annual exhibitions for funding and have seen for-profit trade shows steal their audiences.

The groups haven't offered educational programs that are substantially different from what you find at shows such as ComNet or NetWorld+Interop, and they've been too slow to change their services to meet member needs.

User groups need to rethink their strategies in order to succeed in the 1990s. Here are some of my ideas:

- Groups should team up on conferences. While the annual show may be a source of pride for your group, the conference game is a numbers game — more bodies attract more exhibitors and vice versa — and joining forces just makes sense. It also eases the strain on administrative staff.
- Groups could also combine to offer regional educational opportunities throughout the year. An annual conference alone isn't enough to win — and keep — members.
- Organizations should work with vendors to get group discounts on products and services. Hey, I save money on car rentals through my AAA membership.
- The same thing holds true for training. Groups could cut discount deals with the big training companies and help members keep their staffs on the cutting edge.
- User groups should get on-line. Ironically, many of the big network groups are invisible in cyberspace. That's a shame because on-line services would be an inexpensive way to help members. Groups could set up chat forums devoted to important issues, such as migrating to frame relay, and even sponsor on-line conferences where members can converse with key analysts or vendors.

The beauty of this approach is that any number of vendors and service providers would help defray network costs in exchange for some visibility.

Given all of the challenges network executives face today, user groups should be thriving. Send me your ideas about how user groups can be revitalized.

JOHN GALLANT jgallant@world.std.com

TELETOONS

FRANK AND TROISE

If necessary, I'll keep this group here all afternoon – until I find out Who is using the E-mail address "VAMPIRE CYBERPUNK FROM HELL"!!

DISTRIBUTED COMPUTING

by John R. Rymer

Abandon architectures today, and you'll pay for it tomorrow

We've entered the era of immediate gratification application development. In large corporations as well as small organizations, development managers are turning their backs on comprehensive systems strategies, and buying products and tools that satisfy their needs today. Forget promises of future leaps in functionality, these managers say. The technology and the business change too quickly to make long-term commitments to anything.

Doing away with architecture may clear roadblocks to applications, but without an architecture for the long run, leveraging resources and cost efficiencies virtually disappears. Ultimately, a compromise between the need to deliver business value today and a sound basis for multiple systems tomorrow will be required.

Two recent encounters I've had with user organizations illustrate the whys and wherefores of the antiarchitecture trend.

The first encounter was with a Fortune 500 food company that was building client/server applications to support just-in-time retail distribution. Many of these applications have been constructed using Microsoft Corp.'s Visual Basic without regard to a larger corporate architecture. The architecture may come later — if the company finds a set of products that helps create immediate value.

Systems investments with future payoffs are out, says a key information systems manager, because the company's business changes too rapidly.

The second encounter was with a printing company that selected IBM's NetView/6000 as its network management platform. The reasons: IBM has market momentum, NetView/6000 supports large installations, and the product can be extended to new event-correlation functions the printing company needs. Six months later, the event-correlation features have failed to materialize, and IBM's market momentum has been blunted by the competition. The printing company now questions whether the entire exercise was worth the effort.

Right before our eyes, the concept of enterprise computing architectures appears to be dying. The implications of this trend are huge both for users and the vendor companies that supply them with systems.

For user organizations, building applications without an overall systems plan has a big downside. There's a real danger that today's solutions — built without regard for a larger plan — will become tomorrow's legacy applications. How does the term "client/server legacy systems" sound? It is not an oxymoron even at this early date.

The client/server approach makes it possible to build applications as reusable, sharable modules. This is particularly true on the server side. An application's functional logic and data management functions can be split up to increase flexibility, simplify maintenance and allow integration with other servers.

However, my firm has already encountered users who regret having used client/server technology to build monolithic, difficult-to-maintain applications that don't interoperate with other applications. These client/server applications pose virtually the same problems as mainframe applications.

For network managers, the antiarchitecture trend is a nightmare in the making. The construction of many client/server applications without an overall plan raises the risk that two or more directory services, security services, mail systems, database-access application program interfaces and even transport protocols will find their way into the corporate systems architecture. This makes support complex and expensive.

In addition, without a systems foundation, leveraging one development effort to address a second project is all but impossible. If every application is handled as a separate project, the risk rises that each project will reinvent the wheel. Code reuse? Forget it without architecture.

The implications for vendors are equally as daunting. The most obvious fallout is that many users will turn away from vendors that sell architecture. In this case, architecture is a code word for products and functions that are unavailable today.

Many large, entrenched vendors rely too much on architecture and will be hurt by this trend.

However, some vendors have built internal product architectures that are attractive in the new era. These architectures are founded on the principle of expansion and evolution over time. Vendors in this position stand to serve users much better than those with rigid approaches.

The drumbeat of change and the pressure on user organizations to perform today are strong counterweights to my assertions.

In recent years, few organizations have been able to find a sustainable competitive advantage in a multiyear system investment plan. And the rewards of quick and inexpensive applications, on the other hand, can be considerable.

What's needed, ultimately, is a balance between immediate gratification and long-range planning. This will become more evident when user organizations begin to rebuild their core accounting, inventory, sales and other operational systems using client/server technology.

These systems are too complex and costly to be built using a strictly tactical approach. It makes great sense to build such large applications in stages. But without an architecture, the whole will not be greater than the sum of its parts.

Most organizations are just beginning to encounter long-term architectural issues. They've used client/server technology to build decision-support, competitive intelligence and similar applications that exist on the periphery of corporate operational systems. But the day of reckoning with architecture is inevitable. The pendulum always swings back on these trends in software development. Better to be working on a plan to reconcile the competing pressures now than be caught with horrible inefficiencies later.

Rymer is editor in chief of the *Distributed Computing Monitor,* a monthly report published by Patricia Seybold Group, Inc. of Boston. He can be reached at (617) 742-5200 or via the Internet at jrymer@psgroup.com.

IN-BOX

Not an ancestor

Your article "AT&T makes bold play in data warehousing" (Oct. 31, page 1) accurately de-scribes the new capabilities AT&T Global Information Solutions will be making available to customers with its new sales and marketing solutions and its technology foundation, the Enterprise Information Factory.

Unfortunately, however, the article identifies NCR Corp.'s Warehouse Manager as the Enterprise Information Factory's predecessor. The Enterprise Information Factory goes beyond the decision support concept of the data warehouse. It should not be confused with Warehouse Manager, which was a software product NCR sold in the 1980s to the shipping and distribution industry.

Andre Dahan
Vice president, customer solutions
AT&T Global Information Solutions
Dayton, Ohio

Such a deal

Regarding Scott Bradner's column "Remembrances of things past" (Oct. 31, page 15) in which he discusses the installation costs associated with fiber-optic networks:

I hate being on the same side as George Gilder. He was a major cheerleader for Reaganomics, I remember. Now that he's rooting for the World-Wide Web, it worries me.

However, $100 per month for information services sounds dirt cheap to me. I'm already paying $30 per month for cable, $17.50 per month for my Internet account and about $20 per month for an office phone line to my house. Apparently, there are people who pay more than that just for psychic advice.

Just as the government subsidizes agriculture, gasoline and road construction, there's nothing to prevent it from subsidizing communications. Two hundred billion dollars is just a fraction of the defense budget for the last seven years. And think of the jobs on all levels – from ditch digger to network administrator – fiber installation would create.

Bradley Sherman
Computer specialist
Institute of Forest Genetics
U.S. Forest Service
Albany, Calif.

No speed limit

Dan Minoli's column "Making the case against 25M bit/sec ATM" (Nov. 7, page 20) missed the key technological element of Asynchronous Transfer Mode: It's a *switching* technology.

Just because the pipe can send bits at 25M bit/sec doesn't mean that every ATM cell is sent right after the previous one. Switched virtual circuit connections allow the initiator to request as much bandwidth as needed. A PC with a 25M bit/sec network interface card will probably request a 10M bit/sec variable bit rate circuit to the file server and in the future may accept a circuit connection request, with a reservation of 4M bit/sec for video with audio, from another videoconferencing user. There's no reason why your phone can't have two 64K bit/sec circuits linked to the private branch exchange over the same cable (and no reason why the PBX has to be in the same building).

There is no real speed conversion. The hub or switch takes voice cells created at 64K bit/sec by your phone (received over your 25M bit/sec cable) and

See In-box, *page 58*

USER FORUM

by Michael Green

Windows apps need to be aware of install methods

Too many vendors today offer products that work fine in a stand-alone Windows installation but create havoc in a networked Windows environment. It's time that vendors realize the importance of tailoring their products for networked Windows environments.

I would venture to say that most network administrators install Windows to run almost entirely from the network. The shared portion of Windows is installed in a single directory on a Novell, Inc. file server, which all users can access. This shared portion includes the actual Windows program and supporting files – for example, executables, drivers and dynamic link libraries (DLL).

This common installation method is recommended in the trade journals as the optimal way to balance performance with manageability. However, many popular products were not designed to support these real-world practices.

EXAMPLES ABOUND

A case in point is Lotus Development Corp.'s Notes. The installation procedure for Notes assumes the administrator is installing the files in a stand-alone Windows configuration. This procedure oftentimes deletes files it incorrectly identifies as associated with a previous version of the program being installed. This can have dire consequences.

I am a Novell systems administrator for a major oil company that is a customer site of my firm's. At this site, we have standardized on 1-2-3 Release 4 for Windows. When we installed Notes, the installation program incorrectly identified the olecli.dll file on the server, which allows users to open the 1-2-3 application, as a file Notes didn't need and deleted it. Our users were left unable to use 1-2-3. To resolve the problem, we had to reinstall the missing file.

Another example of a lack of awareness involves products that incorrectly update Microsoft-provided DLLs. These DLLs store application functions that are used by many different programs. When you run the Windows installation procedure, it installs a specific DLL version. An application from another vendor may need a more recent version of that same DLL that has been updated by Microsoft.

As part of the installation routine, the application will compare date and time stamps of the two files (the original Microsoft-provided DLL file and the DLL shipped with the other vendor's application). If the application-provided copy of the DLL is newer than the one in the destination directory, the installation routine replaces the original; otherwise, no change is made.

That's the way it's supposed to work. However, I've run into three programs that installed *older* copies of DLL files. This might be acceptable for a stand-alone environment, but definitely not for a 300-user network like mine.

Another major vendor that offers software products that are not designed to work in a networked-Windows environment is Hewlett-Packard Co. HP ships a printer called the DeskJet 560c. As part of the printer's installation routine, HP determines the location of the Windows program files and attempts to place all of the applications supporting the printer in that directory.

Unfortunately, the directory in which the printer tries to place its programming is most often the shared Windows directory. As a result, the installation routine replaces the Windows print manager with a new HP print manager.

The problem we had here was that HP's print manager was incompatible with our environment. Not surprising, when we contacted HP about this problem, the company's technical support said the 560c is not supported in a networked environment.

On the other hand, Novell's WordPerfect is a great example of a product that *is* networked Windows aware. WordPerfect installs its own DLL files in its own directories. It provides options during installation for networks as well as complete documentation identifying files it plans to install and where it plans to install them.

SOME ADVICE

From my experiences, I have some recommendations for vendors.

First, vendors should make sure their products' installation programs provide options for installing the products in both stand-alone and network environments.

In addition, vendors should provide two options for installing their products on a network: administrator install, which provides advanced installation options like directory names; and end-user install, which copies to the end user's directory only the portion of the program he or she is allowed to modify.

And most important, vendors should write installation routines that accommodate the real-world practice of sharing Windows on a network. These routines should install only Microsoft-provided drivers and DLLs into the Windows directory structure (and make sure these files are more recent than those they are replacing) and install all the products' other files in their own directories.

Network administrators aren't going to put up with the current situation for long. If vendors want to retain customers, they had better start working on making their products networked Windows aware.

➾ Green is a technical analyst with Paranet, Inc., a Houston-based company that integrates and supports multivendor networks. He can be reached at (713) 775-2058 or via CompuServe at 76304,510.

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Buyer's Guide

Upgrades extend the mux model year

New interfaces, better management keep T-1/T-3 muxes alive, but for how long?

By Bruce Glassford, Doug Hurley and Celia Liu

Just when it appears that the venerable T-1/T-3 multiplexer has reached the limits of its life, vendors are sprucing it up with newfangled interfaces to speedier services and improved management.

To get this elder member of the networking community to thrive for yet another year, many vendors are plopping interfaces to Asynchronous Transfer Mode and Synchronous Optical Network (SONET) services into their muxes, and building new adapters that bolt the devices directly to LANs. Vendors are also adding support for the Simple Network Management Protocol at a more rapid pace. In fact, twice as many muxes support SNMP today than just a year ago.

While vendors are resurrecting their old workhorses with new features, their efforts may just be short-term fixes. Equipment makers have done little to overhaul the internal architectures of muxes to support today's emerging technologies such as ATM. For instance, the vast majority of products are still based on tried-and-true time-division multiplexing (TDM) technology.

Rather than overhaul the guts of their T-1/T-3 muxes, most major vendors, such as Ascom Timeplex, Inc. and Newbridge Networks, Inc., are funneling development dollars into stand-alone ATM switches that can more easily be upgraded as technology advances.

There are a few exceptions. StrataCom, Inc., for one, uses an ATM bus in conjunction with TDM to support a cell switching architecture on its IPX family. General DataComm, Inc. (GDC) offers a packet mode bus on its Office Communications Manager (OCM) and TMS-3000 products. Network Equipment Technologies, Inc.'s (NET) SONET Transmission Manager (STM) product line uses a cell-based backplane to act as a SONET switch. While these firms also offer ATM switches, their muxes can offer many of the high-speed data networking and voice options sought after by leading-edge users as well as carriers.

Vendors agree that mux technology is mature and that growth will come slow, if at all. In fact, vendors see lower prices coupled with more functionality as a driving trend. These vendors are also banking on ATM switch and service implementation delays to keep interest in their products alive.

For instance, while some users wait patiently for the ATM express train to arrive, the mux makers will continue adding higher speed interfaces and ATM-like functionality into their time-tested boxes, hoping to win the hearts and cash of the users who can't wait.

These vendor efforts make an evaluation of muxes pretty straightforward. Users will want to closely examine the type of new interfaces each vendor supports, how well the box provides intelligent processing services such as route selection, circuit prioritization and bandwidth allocation, and how well it integrates with centralized network management environments.

Lastly, users that are looking to add units to an existing mux-based net need to carefully check for interoperability among products. Even though products meeting basic CCITT-defined signaling methods interoperate well, the use of more complex features, such as bandwidth allocation and channel prioritization, requires each unit to support a common and often vendor-proprietary specification.

MUX CATEGORIES

In general, the mux market is split into three categories. At the high end are broadband networking multiplexers that support T-3 links at minimum and can

Continued on page 49

INSIDE

Buyer's Guide chart steers you through 45 products.
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Short List entrants lead the way with SONET and ATM support.
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DSU/CSUs horn in on T-1 mux turf.
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Readers tell all about mux usage and deployment.
Page 52.

T-1/T-3 multiplexers

Company	Product	Type	Bus		Framing	Interface	No. of slots	Carrier interfaces: Ports per board								User interfaces: Ports per board							Features					Mgmt.	Platform	Price/ Warranty (Months)
		F1 = Fractional T-1 F3 = Fractional T-3 S = SONET switch T1 = T-1 T3 = T-3	Type: Speed per bus (Bit/sec) F = Frame relay T = TDM O = Other	Aggregate throughput (Bit/sec)	2 = G.732 D = D4/CCIT 3 = G.733 E = ESF 4 = G.704 T = T-3	Type: Max. no. of ports C = Carrier U = User	Per carrier/ Per user	Analog	DDS	DS0	T-1	T-3	Fractional T-1	Frame relay	Nx56K/64K bit/sec	Analog	D4	E&M signaling	RS-232	RS-449	V.35	X.21	Channel prioritization	Nx56K bit/sec inverse muxing	NxT-1 inverse muxing	Redundant power	Redundant processors	C = CMIP N = NetView P = Proprietary S1 = SNMPv1 S2 = SNMPv2	H = HP OpenView N = NetLabs NV = NetView/6000 S = SunNet Manager	
Ascom Timeplex, Inc. (800) 699-2298	EntreeLink	T1	T: 5M	5M	D, E	C: 4 U: 44	4/11				1							4	4			4	✔			(1)		P		$5,230/12
	Link/2+	F1, T1	T: 10.5M	10.5M	2, D, E	C: 5 U: 208	7/55				1		1			4	1	4	4	4	4	4	✔	✔		(1)	(1)	P		$9,165/12
	MicroLink	F1, T1	T: 10.5M	10.5M	2, D, E	C: 5 U: 16	5/5				1		1			4	1	4	4	4	4	4	✔	✔		(1)	(1)	P		$7,550/12
	MiniLink	F1, T1	T: 10.5M	10.5M	2, D, E	C: 7 U: 44	7/12				1		1			4	1	4	4	4	4	4	✔	✔		(1)	(1)	P		$12,480/12
	TX3/SuperHub	F3, T3	T: 72M	720M	3, 4, D, E, T	C: 7 U: 196	10/10				4	1					4			1	1		✔		(1)	(1)	(1)	P		$30,000-$100,000/12
AT&T Paradyne (800) 482-3333	Acculink Access Controller	T1	T: 2M	16M	2, 3, 4, D, E	C: 8 U: 80	4/8	8	2, 5, 10	4	1, 2			8		8	8	8						(1)		(1)	(1)	S1		$6,000-$24,000/12
Cray Communications, Inc. (800) 367-2729	TIE-6	F1, T1	T: 1.54M	1.54M	D, E	C: 25 U: 30	7/6	2, 4	5	1	1		1		1	2, 4	1	2, 4	1, 2, 5	1	1	1		(1)				P, S1	H, N, NV, S	$3,200-$5,450/Lifetime
	TIE-12	F1, T1	T: 1.54M	1.54M	D, E	C: 25 U: 60	13/12	2, 4	5	1	1		1		1	2, 4	1	2, 4	1, 2, 5	1	1	1		(1)				P, S1	H, N, NV, S	$4,600-$9,400/Lifetime
	TIE-24	F1, T1	T: 1.54M	1.54M	D, E	C: 25 U: 120	25/24	2, 4	5	1	1		1		1	2, 4	1	2, 4	1, 2, 5	1	1	1		(1)				P, S1	H, N, NV, S	$5,100-$9,600/Lifetime
Digital Link Corp. (408) 745-6200	DL3000 Digital Service Multiplexer	T3	F: 300M	176M	T	C: 8 U: 52	4/14				1						4			2	2					✔		S1	S	$20,000/24
	DL3100 Digital Service Multiplexer	T3	(2)	44M	T	C: 1 U: 3	1/3					1									3							S1	H, S	$7,895-$15,495/24
DTS, Inc. (800) 353-9387	4704 FlexT1	F1, T1	T: 1.54M	6M	D, E	C: 4 U: 7	4/4				1		1	1			1		1	2	2					✔	✔	P, S1	H, S	$2,650-$9,450/60
Gandalf Technologies, Inc. (800) 426-3253	Access 2050	F3	O: 25M	409M	2, 3, 4, D, E, T	C: 16 U: 16	16/16	4, 16	4	4, 24	2		4	2	4	4, 16	4	2, 4	4	4	4	4	✔	✔	✔	✔	✔	S1	H	$35,000-$150,000/12
General DataComm, Inc. (203) 574-1118	Office Communications Manager	F1, T1	T: 4M O: 32M	36M	3, 4, D, E	C: 2 U: 120	4/30	1	1	1	1		1	1	1	2	1	1	2	1	1	1	✔			✔	✔	P, S1	H	$2,000-$10,000/12
	TMS-3000	F1, T1	F: 270M T: 45M O: 17M	256M	2, 3, 4, D, E	C: 16 U: 512	16/512		1	1	2		2	130	23		2	1	1	1	1	1	✔			✔	✔	P, S1	H	$10,000-$100,000/12
Larscom, Inc. (408) 988-6600	Orion 4000	T3	O: 155M	155M	E, T	C: 80 U: 20	11/10				8	1									2				✔	(1)	(1)	P, S1	H, NV, S	$16,500-$60,000/24
Netrix Corp. (703) 742-6000	Series 10 Model 70	T1	T: 8M	64M	2, 3, 4, D, E	C: 32 U: 32	32/32	8	1	1	1		1	1	1				1		1	1	✔			(1)	(1)	P, S1		$30,000-$100,000/12
	Series 1000 Model 1216	T1	T: 8M	64M	2, 3, 4, D, E	C: 64 U: 64	64/64		4	4	2, 4		2, 4	4	4				4		4	4	✔			(1)	(1)	P, S1		$28,400-$91,600/12
Network Equipment Technologies, Inc. (415) 366-4400	IDNX/Micro 20	T1	T: 32M	32M	2, 4, D, E	C: 7 U: 360	7/11		1	1	1	4, 48	1	8	1	4	2	4, 48	2	2	4	4	✔			(1)	(1)	C, N, S2	H, NV	$8,500/12
	IDNX/20	T1	T: 32M	32M	2, 4, D, E	C: 15 U: 360	15/22		1	1	1	4, 48	1	8	1	4	2	4, 48	4	2	4	4	✔			(1)	(1)	C, N, S2	H, NV	$17,000/12
	IDNX/20-S	T1	T: 32M	32M	2, 4, D, E	C: 15 U: 360	15/18		1	1	1	4, 48	1	8	1	4	2	4, 48	4	2	4	4	✔			(1)	(1)	C, N, S2	H, NV	$9,000/12
	IDNX/70	T1	T: 256M	256M	2, 4, D, E	C: 96 U: 768	96/112		1	1	1	4, 48	1	8	1	4	2	4, 48	4	2	4	4	✔			(1)	(1)	C, N, S2	H, NV	$37,250/12
	IDNX/90	T3	T: 256M	256M	2, 4, D, E, T	C: 96 U: 2K	96/112		1	1	1	1	1	8	1	4	2	4, 48	4	2	4	4	✔			(1)	(1)	C, N, S2	H, NV	$60,000/12
	SONET Transmission Manager/S8	F3, S, T3	O: 498M	498M	D, E, T	C: 96 U: 96	13/13				8	1		(3)			8			4	4		✔		✔	✔	✔	N, P, S1	H, NV, S	$61,500/12
	SONET Transmission Manager/S12	F3, S, T3	O: 748M	748M	D, E, T	C: 96 U: 96	13/13				8	1		(3)			8			4	4		✔		✔	✔	✔	N, P, S1	H, NV, S	$92,500/12
	SONET Transmission Manager/E12	F3, S, T3	O: 748M	748M	D, E, T	C: 336 U: 336	50/50				8	1		(3)			8			4	4		✔		✔	✔	✔	N, P, S1	H, NV, S	$120,500/12
	SONET Transmission Manager/E18	F3, S, T3	O: 1.1G	1.1G	D, E, T	C: 336 U: 336	50/50				8	1		(3)			8			4	4		✔	✔		✔	✔	N, P, S1	H, NV, S	$153,350/12
	SONET Transmission Manager/E26	F3, S, T3	O: 161G	1.61G	D, E, T	C: 336 U: 336	50/50				8	1		(3)			8			4	4		✔		✔	✔	✔	N, P, S1	H, NV, S	$194,500/12
Newbridge Networks, Inc. (703) 834-3600	3600 MainStreet Bandwidth Manager	T1	F: 100M T: 32-64M	260M	2, 3, 4, D, E	C: 32 U: 1.5K	16/16	96	6	6	2		2	6		96		6	6	4	6	6	✔	✔		(1)	(1)	C, N, P, S1, S2	H	$10,000-$60,000/12
	3645 MainStreet Bandwidth Manager	T3	F: 100M T: 512M	612M	2, 3, 4, D, E, T	C: 256 U: 12.3K	128/128	96	6	6		1	2	2		96		6	6	4	6	6	✔	(1)		(1)	(1)	C, N, P, S1, S2	H	$40,000-$200,000/12
	3620 MainStreet Branch Access Controller	T1	T: 1.54M	1.54M	3, D, E	C: 1 U: 4	1/6				1		1			2	1	2	2	1	1	1	✔					P, S1	H, N, NV, S,	$2,200-$8,000/60
Racal-Datacom, Inc. (800) 722-2555	Omnimux/ CMS 9000	T1	T: 16M, 32M	128M	2, 3, 4, D, E	C: 16 U: 144	16/36		1	1	1	1	1			4	1	4	4	2	2	2	✔			✔	✔	P	H, NV	$15,000-$100,000/12
RAD Data Communications, Inc. (201) 529-1100	FCD-12	F1	T: 2.04M	2.04M	2, 3, 4, D, E	C: 1 U: 2	1/2			1			1							2	2	2								$1,750-$2,000/15
	FCD-14	F1	T: 2.04M	2.04M	2, 3, 4, D, E	C: 1 U: 4	1/4			1	1		1				1			4	4	4								$2,800-$3,700/15
	Kilomux-2000	F1	T: .768M	.768M	(4)	C: 2 U: 72	2/12	2	1									2	4	4	2	2	✔			(1)	(1)	P		$1,800-$7,500/15
	Megaplex-2000	F1, T1	T: 2.04M	2.04M	2, 3, 4, D, E	C: 2 U: 60	2/10	6	4	1	2		3				1	4	6	2, 3, 4	2, 3, 4	2, 3, 4	✔			✔		N, P, S2	NV	$4,400-$12,000/15
	Megaplex-2004	T1	T: 2.04M	2.04M	2, 3, 4, D, E	C: 2 U: 24	2/4	6	4	1	2		3				1	4	6	4	4	4	✔			✔		N, P	NV	$2,800-$6,000/15
StrataCom, Inc. (800) 767-4479	IPX 32 (5)	F1, T1, T3	T: 32 M O: 32M	32M	2, 3, 4, D, E, T	C: 930 U: 930	32/32		4	31	1	1	1	31	1		1	1	8	4	4	4	✔			✔	(1)	P, S1	H, NV	$225,000-$250,000/3

T-1/T-3 multiplexers

Company	Product	Type	Bus		Framing	Interface	No. of slots	Carrier interfaces: Ports per board								User interfaces: Ports per board							Features					Mgmt.	Platform	Price/ Warranty (Months)
		F1 = Fractional T-1 F3 = Fractional T-3 S = SONET switch T1 = T-1 T3 = T-3	Type: Speed per bus (Bit/sec) F = Frame relay T = TDM O = Other	Aggregate throughput (Bit/sec)	2 = G.732 D = D4/CCIT 3 = G.733 E = ESF 4 = G.704 T = T-3	Type: Max. no. of ports C = Carrier U = User	Per carrier/ Per user	Analog	DDS	DS0	T-1	T-3	Fractional T-1	Frame relay	Nx56K/64K bit/sec	Analog	D4	E&M signaling	RS-232	RS-449	V.35	X.21	Channel prioritization	Nx56K bit/sec inverse muxing	NxT-1 inverse muxing	Redundant power	Redundant processors	C = CMIP N = NetView P = Proprietary S1 = SNMPv1 S2 = SNMPv2	H = HP OpenView N = NetLabs NV = NetView/6000 S = SunNet Manager	
T3plus Networking, Inc. (800) 477-7585	BMX45N Broadband Bandwidth Manager	T3	T: 800M	800M	D, E, T	C: 12 U: 84	36/ 36				7	2		2						2	2		✓		(1)	✓	(1)	S1	H, NV, S	$18,000-$85,000/ 12
	BMX45S Broadband Bandwidth Manager	T3	T: 180M	180M	D, E, T	C: 12 U: 21	5/5				7	2								2	2		✓		(1)		(1)	S1	H, NV, S	$18,000-$40,000/ 12
Telco Systems, Inc. (800) 477-8832	Access60: Network Access Server	T1	T: 16M	64M	3, 4, D, E	C: 20 U: 78	15/ 13	2, 6	1, 5		1, 2		1, 2	2, 10	2, 5	2, 6	1, 2	2, 6	1, 2, 4	1, 2, 4	1, 2, 4	1, 2, 4	✓	(1)	(1)	(1)	(1)	S1	H	$6,500-$30,000/2
	Route-24 Network Access Multiplexer	T1	T: 1.54M	T1.54M	3, D, E	C: 2 U: 96	1/1				1, 2		1, 2			1	1	1, 2	1, 2, 4	1	1			(1)		(1)		P, S1	H	$3,200/2
TyLink Corp. (800) 828-2785	SNS 256	T1	(6)	1.54M	3, D, E	C: 4 U: 4	1/4			1	1		1				2		2	4			✓					P		$3,995-$5,495/12
	SNS 400	F1, T1	(6)	1.54M	3, D, E	C: 1 U: 4	1/4			1	1		1				2		2	4	4		✓					P		$4,995-$6,495/12
	SNS 4000	F1, T1	(6)	1.54M	3, D, E	C: 1 U: 4	1/4			1	1		1				2		2	4	4		✓		✓			P		$6,995-$8,995/12

Products highlighted by color were selected for The Short List.

Chart compiled by Chen Paquet

FOOTNOTES:
(1) Provided as an option.
(2) Vendor did not supply information.
(3) Via DS1 at physical layer.
(4) Proprietary framing.
(5) Also provides an 8-slot model with 186 user- or carrier-side ports for $12,000-$70,000 and a 16-slot model with 434 user-or carrier-side ports for $17,000-$168,000.
(6) 8088 processor acts as stand-alone product.

CMIP = Common Management Information Protocol
DDS = Digital data service
ESF = Extended superframe format
SONET = Synchronous Optical Network
TDM = Time-division multiplexer

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expand into the SONET arena. Broadband muxes fit best in carrier networks but can anchor very large enterprise WANs. These muxes have hundreds of interchangeable user- and carrier-side ports. They include NET's STM family of products, with buses ranging in speed from 498M to over 1G bit/sec; T3plus Networking, Inc.'s BMX45S Broadband Bandwidth Manager, with a 180M bit/sec bus; and T3plus' BMX45N Broadband Bandwidth Manager, with an 800M bit/sec bus.

Wideband networking multiplexers fit the midrange. These products typically hit capacity with a T-3 interface or multiple T-1s. They are more widely used in enterprise backbones, receiving and routing data from lower end access muxes. Products in this category include Netrix Corp.'s Series 10 Model 70 and Series 1000 Model 1216, with top bus speeds of 64M bit/sec, as well as Telco Systems, Inc.'s Access60: Network Access Server, also with a top bus speed of 64M bit/sec. Wideband products generally have hundreds of user- and carrier-side ports.

The expanded capabilities of a broadband mux such as T3plus' BMX series or NET's STM series can provide a strong base for supporting current needs if they exceed T-1, while permitting growth through the T-3 link sizes. If needs will grow to a single T-3 or remain below that threshold in the future, wideband muxes can still provide the growth capability, often at lower costs.

At the low end are access multiplexers that generally have a small number of ports and top out at T-1. These units are feeder nodes that concentrate data from several terminal devices and shovel it across one or more trunks leading to wideband or broadband muxes.

Access products include RAD Data Communications, Inc.'s FCD-12 and FCD-14, with 2.048M bit/sec buses; Telco Systems' Route-24 Network Access Multiplexer, with a 1.544M bit/sec bus; and TyLink Corp.'s SNS family of muxes, each with a 1.544M bit/sec backplane.

Access muxes can compete against the growing number of multiplexing data service units/channel service units, which have a limited number of carrier ports and typically a maximum of 24 user ports. These devices support basic T-1 and fractional T-1 standards by performing TDM to put the 24 input feeds onto the single output. These are primarily commodity items

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NETWORK WORLD
SHORT LIST
1 9 9 4

T-1/T-3 multiplexers

The Short List highlights products Network World *recommends you examine during the purchasing process for T-1/T-3 multiplexers. Products included on The Short List are among the early leaders in providing Synchronous Optical Network (SONET) or Asynchronous Transfer Mode interfaces and provide advanced functionality as noted on top of strong management. These products will meet the needs of users with multivendor enterprise networks. Your needs may differ.*

■ General DataComm, Inc.
TMS-3000

GDC is among the few vendors to break from the traditional time-division multiplexing backplane with implementation of a packet mode bus. This bus enables the box to effectively handle the functions of a mux, router and frame relay switch.

The product also sports a direct Ethernet and token-ring LAN attachment that works in conjunction with its implementation of CrossComm Corp.'s Protocol Independent Routing facility to take data off LANs and route it over the wide area.

Other vendors have LAN interfaces that pass Simple Network Management Protocol data from the mux to a local SNMP-based workstation. GDC is also among the few vendors with an interface to ATM carrier services and promises to deliver a user-side ATM interface soon.

Both the TMS-3000 and GDC's lower end Office Communications Manager feeder can be managed from Hewlett-Packard Co.'s HP OpenView platform.

■ Network Equipment Technologies, Inc.
SONET Transmission Manager family

Originally developed by its NET's Adaptive Corp., the STM family of broadband muxes is one of the few available today that supports true SONET switching.

NET absorbed the STM product line to complement its existing IDNX family and free Adaptive to focus on ATM switch development. The STM family manages bandwidth up to the OC-3 rate of 155M bit/sec.

All port modules are interchangeable among any model and upgrades are accomplished with electronic software distribution. STM products offer strong management features including a fault-tolerant, fully redundant architecture and distributed network intelligence that offers fast rerouting capabilities.

The STM products can also be managed from SunSoft, Inc.'s SunNet Manager. NET also deserves credit for being among the few vendors to support the robust features of SNMPv2.

■ Newbridge Networks, Inc.
3620 MainStreet
Branch Access Controller

While Newbridge offers strong broadband and wideband products, it should get some credit for having a highly functional access multiplexer that feeds data from low-volume sites into the enterprise backbone.

The 3620 MainStreet Branch Access Controller has what it takes to handle voice and various forms of data such as LAN and IBM Systems Network Architecture traffic in a single, yet small box. It can also be managed by the same wide variety of management platforms as its bigger brethren. The box may not do much else, but what more is needed from an access mux?

■ StrataCom, Inc.
IPX family

The cell-based switching architecture found in the IPX family make it among the best suited for accessing the widest variety of public net services. The IPX 8 tabletop/rack-mountable unit, IPX 16 single-shelf unit and IPX 32 dual-shelf cabinet supports frame relay, ISDN and ATM on the carrier side, and ATM and Ethernet on the user side.

All products share the same feature modules. StrataCom's management system can run on OpenView or IBM's NetView/6000.

■ T3plus Networking, Inc.
BMX family

This pair of broadband muxes were among the first to support a rich set of T-3 circuit access methods and dynamic bandwidth allocation T-3 environments.

Today, support for OC-3 SONET interfaces and direct Ethernet attachments keep the BMX family a leader in broadband networking. T3plus was also a pioneer in bringing inverse multiplexing technology to the T-3 world. Its NxT-1 inverse multiplexing feature enables users to spread very high-speed data such as a multimegabit file transfer across multiple T-1 circuits when a full T-3 would be too much.

Both models come with an integrated SNMP agent at no cost and can be managed from OpenView, NetView/6000 or SunNet Manager platforms.

T3plus also offers BMXView, a Unix- and SNMP-based proprietary network management system.

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that support simple management functions (see story, this page).

The T-1/T-3 mux market is dominated by Ascom Timeplex, GDC, NET, Newbridge and StrataCom, according to Datapro Information Services Group, a consultancy in Delran, N.J.

Each vendor has a full line of products that cross all three categories.

These vendors have also been among the most active in adding new interfaces and improved management to their wares. Their efforts are aimed at repositioning the mux in user networks to satisfy existing customers' demand for high-speed access to public network services rather than breaking into new accounts.

Customers' needs are changing as public services such as virtual private networks and switched data links are thrown into the enterprise network mix. In response, muxes are making a 180-degree turn from supporting only private-line nets to supporting hybrid networks of leased and public services.

Vendors with bridge/router modules

- GDC
- NET
- Newbridge

Note: AT&T Paradyne promises bridge/router support in the future.

T-1/T-3 muxes seem to be making the adjustment just fine. While their technology is aging and they're bumping up against architectural limits, muxes still reliably force disparate types of signals across a single dedicated T-1 or T-3 trunk, allowing users to mix voice and data traffic on the same line.

Making sure muxes hold true to their roots of mixing different types of traffic on a single line seems to be a vendor strategy that meshes well with reality. The vast majority of users looking to buy T-1/T-3 muxes today are the ones that already have investments in the technology. Only a few users today are getting into the market for the first time.

And users are looking for hot-swappable components, something most muxes already provide, as well as high-speed data service interfaces and support for a wide variety of circuit allocation methods. It seems that users just want reliable muxes that do what they are supposed to and are hesitant to embrace boxes that claim to do it all (see graphic, page 52).

"The expectation is for small annual growth, so we're counting on a loyal customer base," says John Stewart, director of corporate communications for Ascom Timeplex. The company proves that at least one vendor is comfortable with its maturing position and with bringing in 5% to 10% growth in U.S. sales a year.

GAINING PUBLIC SUPPORT

Users in the market for muxes are looking for products that sport more public-switched network service interfaces.

"In the U.S., the carriers have succeeded in putting voice back onto the public network, and they are now struggling to get user data on the public network," says William Engler, product manager at Ascom Timeplex.

Multiplexer vendors are certainly in no position to buck this trend, especially as frame relay and ATM switches that promise to provide that type of public network access start entering the market.

Frame relay and ATM offer streamlined forms of packet multiplexing and are among the sought-after data interfaces. Designed for bursty LAN traffic, frame relay transports variable-length frames at T-1 speed and, in some cases, beyond. ATM handles data, voice and video, transmitting in fixed-length, 53-byte cells at a very high speed that often reaches T-3.

With frame relay and ATM interfaces, muxes can utilize bandwidth more efficiently, allocating it dynamically as needed to end-user equipment. As frame relay and ATM move data more quickly, muxes must provide interfaces to higher spped services such as fiber-based SONET links that typically start off at the OC-3 rate of 155M bit/sec.

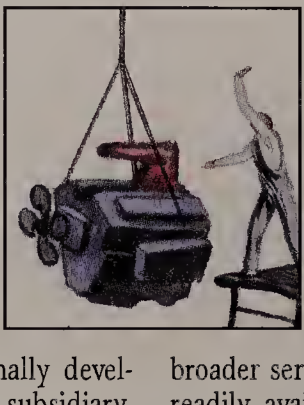
At the same time, muxes can offer more traditional interfaces to circuit-switched carrier leased-line services and voice services such as virtual private nets. Increasing support for ISDN Primary Rate Interface and Basic Rate Interface links are helping out in supporting circuit-switched traffic.

"The next-generation intelligent T-1 multiplexers will have to switch both circuits and frames and integrate both technologies across a single-carrier facility," Engler says. "It will have to integrate private and public frame-switched services, as well as provide public and private circuit-switched services. Overall, this T-1 mux will have to allow customers to take advantage of public tariffs while preserving the security and flexibility of a private network."

Ascom Timeplex is fixed on a strategy of providing feature-rich but mature and proven products that focus on what they do best — multiplexing. To keep true to it strategy, Ascom Timeplex now offers ISDN PRI access to public carrier services as well as a High Speed Serial Interface (HSSI) that accepts data from a user-side device at up to 52M bit/sec, enough to feed a 45M bit/sec T-3 link on the carrier side of its TX3/SuperHub.

However, the company's Link family of products do not support bridging, routing, ATM switching or standard management.

StrataCom, on the other hand, has the strongest public-switched services support in its IPX family, which supports frame relay, ISDN and ATM on the carrier side, and ATM as well as Ethernet interfaces on the user side. All IPX products share the same modules.



StrataCom also provides an ATM-based switching product called the BPX (*NW*, Sept. 19, page 69). Currently, NET is the only vendor offering a full-fledged line of SONET switches. The STM family of broadband multiplexers, originally developed by its Adaptive Corp. subsidiary, enable NET to manage a mix of traffic across OC-3 links. All port modules in this family are interchangeable between models, and upgrades are accomplished with electronic software distribution. While carriers seem more interested in snapping up STM models, very large users can also benefit from the product family's fault-tolerant, fully redundant architecture and distributed network intelligence that offers fast rerouting capabilities.

Adaptive is now focused on ATM switch development.

Other vendors are getting on the SONET bandwidth wagon. T3plus' BMX series, for instance, was among the early providers of an interface to OC-3 carrier services. AT&T Paradyne is planning to deliver an OC-1 SONET interface operating at 51.84M bit/sec as well as an OC-3 SONET interface late next year. AT&T Paradyne may need to upgrade its existing 16M bit/sec bus to handle the interfaces, however.

ATM, FRAME RELAY AND ISDN

Given the hype about ATM, there are surprisingly few mux makers embracing the technology. Only two vendors offer ATM interfaces for their high-end muxes — GDC has an ATM link on the carrier side and plans to deliver one for the user side, while StrataCom has one on both the carrier and user sides.

The reason for the slow implementation is that vendors don't yet see the urgency to supply ATM interfaces.

"Although a number of new technologies — frame relay, SMDS and ATM — are candidates for public data networks, I believe that frame relay will be the public data network of choice," Engler says. "The standards are relatively mature, and the technology is gaining user acceptance."

Indeed, frame relay is supported more prevalently than ATM. Although frame relay's top rate of T-1 or a little above can't match ATM's OC-3 speed, its packet-mode operation enables remote sites to feed traffic over a short access line into a carrier network that switches the traffic to a central site. This eliminates the need to extend full T-1 lines from each remote site to a company's headquarters.

Frame relay has been around long enough and has become stable enough as a standard for many mux vendors to now offer it as part of their basic mix of interfaces.

On the other hand, the number of vendors offering ISDN interfaces has grown. Seven vendors, the leading providers among them, now provide links to T-1-based ISDN PRI circuits. Three vendors now offer links to ISDN BRI circuits. Other firms support ISDN through a HSSI link or V.35 link to a stand-alone device providing ISDN access.

Used in conjunction with intelligent network services, ISDN can reduce the number of lines required to access public services.

For instance, channels on an ISDN PRI can be groomed to access various carrier services, eliminating the need for separate access lines for each service.

As new lower tariffs and broader service rollouts make ISDN more readily available, more mux makers will offer PRI and BRI links that will enable users to trim the number of leased lines in their networks. ISDN's capability to dial up connections on demand will further fuel ISDN deployment on muxes.

LAN LINKED

As users started tapping muxes as the conduit to provide links between LAN routers, more mux makers began sticking direct

The DSU/CSU alternative to T-1/T-3 nets

With the addition of basic time-division multiplexer buses and more board slots, data service unit/channel service unit (DSU/CSU) vendors have steadily moved into the T-1/T-3 multiplexer arena.

Users that simply need to aggregate data from a few local devices onto a single T-1 or T-3 circuit that feeds into a private network, public network service or a hybrid private/public net will find multiplexing DSU/CSUs provide exactly what they need for little money. Many of them sport redundant WAN links, but their limited bus speed makes it impossible to use the links simultaneously.

Multiplexing DSU/CSUs have evolved into a relatively stable, commodity market. With almost no exceptions, one vendor's multiplexing DSU/CSU will interoperate with any other vendors' offering because they all support the same basic, standard functionality.

Each also provides basic management functions, with many supporting a Simple Network Management Protocol agent. The only major variation among products is the type of interfaces supplied on the user side.

A multiplexing DSU/CSU sampler

Company	Product (s)
AT&T Paradyne	Acculink 3160 T-1 CSU/DSU
Digital Link	DL100 Encore, VX Encore T-1/FT-1 DSU/CSU, DL1200/2400 Digital Service Hub, DL600 E-1 Data Multiplexer, DL3202 Digital Cell Multiplexer and DL3800 Multiport CSU/DSU
Larscom	Mega-T, Orion 200/400, Split-T, Access-T, Network Access DSU, Access-T 45 and Split-T SMDS
Telco Systems	Access 30 Multiport CSU/DSU
TxPort	Prism 3030 and Prism 3060
TyLink	ONS 400 and ONS 150

A few multiplexing DSU/CSU vendors are adding some form of intelligence to their products. For instance, Digital Link Corp. and Larscom, Inc. have introduced inverse multiplexing to their product lines.

Digital Link's DL3800 Inverse Multiplexer spreads high-speed data received from a local device on a High Speed Serial Interface (HSSI) or V.35 port across as many as eight T-1 WAN circuits. Larscom's Mega-T spreads data from a HSSI or V.35 port across as many as four T-1s. Similar units on the other end of the WAN link reassemble data received on the multiple T-1s to the original high-speed data stream.

Multiplexing DSU/CSUs are joined by other unique T-1 network access devices. FastComm Communication Corp.'s Channelized Link Controller, for example, is a specialized tool that feeds channelized frame relay data across a V.35 interface to a single T-1 or fractional T-1 carrier link.

In addition, Harris & Jeffries, Inc.'s CT3/EISA Card resides in a personal computer with an Extended Industry Standard Architecture bus and provides access to a T-3 circuit. The board includes M13 multiplexing features that make it suitable for taking multiple high-speed video feeds and merging them on a single T-3.

LAN interfaces into their boxes. A direct LAN attachment used in conjunction with an integral bridge/router module can obviate the need to hook an external router or bridge via V.35 or RS-232 links to a T-1 mux that provides access to WAN services.

However, only a handful of vendors offer integral bridge and routing capabilities. While the number is up from a year ago, the increase is not dramatic.

GDC has emerged as a leader in this area. Its OCM and TMS-3000 support CrossComm Corp.'s Protocol Independent Routing (PIR) facility on an interface card to allow routing of Ethernet or token-ring traffic. This will let the OCM or TMS-3000 connect directly into a LAN and provide WAN routing capabilities.

PIR behaves curiously, acting more like a bridge than a router, distributing addresses throughout the network and maintaining tables everywhere.

The benefit is that products supporting PIR don't have to be reconfigured to support new higher level protocols as they are added to the net. This enables PIR to handle all types of traffic without additional software.

T-3/E-3 market on the rise

Worldwide sales of T-3/E-3 muxes are expected to reach $68.1 million this year, nearly 20% more than 1993. T3plus is estimated to be the big winner, capturing 33% of the 1994 sales and turning a $22 million profit.

SOURCE : INTELLIQUEST, AUSTIN, TEXAS

NET's IDNX family also supports routing of Ethernet or token-ring traffic using source routing, source routing transparent, and transparent bridging techniques.

T3plus, DTS, Inc. and StrataCom offer Ethernet ports, but for management purposes only. These ports have an integrated SNMP agent that collects management data from the mux and passes it over an Ethernet net to a SNMP-based workstation.

In the access multiplexer arena, Newbridge offers an integrated bridge/router on its 3620 MainStreet Branch Access Controller. This positions the product as among the few access muxes that can mix voice, data and LAN traffic on links into an enterprise net.

BANDWIDTH MANAGEMENT

The function of multiplexing multiple inputs onto a single aggregate link is about as basic and simple as bandwidth management gets, and is something every mux does well. However, there are a few bandwidth management wrinkles being added to various vendors' boxes.

Among the leading techniques is inverse multiplexing, which enables the mux to spread high-speed data inputs across multiple carrier lines for transmission and reassembling the data from those lines back into the original datastream at the other end.

Inverse multiplexing was first made available on an Nx64K bit/sec basis, where a high-speed datastream was spread across multiple 64K bit/sec links. This Nx64K bit/sec is now popular across mux platforms.

However, a few vendors led by the likes of T3plus have introduced NxT-1 muxing, which spreads very high datastreams such as a multimegabit file transfer across multiple T-1 lines. NxT-1 multiplexing can save money by enabling users to exceed the WAN bandwidth available on a T-1 mux without having to move to a T-3 product. T3plus says NxT-1 muxing also puts off the purchase of expensive T-3 interface boards on muxes capable of handling T-3 WAN circuits.

There are other unique bandwidth allocation methods. Telco Systems, for example, offers time-of-day bandwidth allocation in its Access60: Network Access Server. The feature enables users to tune mux configuration according to expected loads on various channels at different times of the day.

T3plus includes dynamic bandwidth allocation that assigns WAN bandwidth to incoming data on an as-needed basis, as does StrataCom's IPX. NET's IDNX series provides bandwidth on demand through its ISDN PRI interface, assigning channels as they are needed.

These bandwidth management features permit users to set the size of each WAN channel according to their current needs. The multiplexer then dynamically allocates new channel sizes as spare bandwidth becomes available, thus speeding up traffic on heavily used routes without requiring user intervention.

Another common bandwidth management feature — route selection — enables users to automatically or manually route traffic around circuit failures or spread overflow traffic across alternate routes during peak periods.

Most vendors offer manual alternate route selection as a minimum. NET's STM series, as well as Netrix's Series 10 Model 70 and Series 1000 Model 1216, offer automatic alternate route selection that permits circuit recovery

Continued on page 52

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Continued from page 51

without user intervention.

In addition, many vendors offer time-of-day alternate route selection to facilitate switching to alternate paths to handle various loads expected at different times of the day.

Another common, yet important, bandwidth management feature is channel prioritization, which enables users to select one or more channels to provide bandwidth to certain users first. This feature enables net managers to guarantee that certain users, such as a company president, will have a specific amount of bandwidth when it is needed, regardless of who else may be using it at the time. For instance, when an important high-speed file transfer must be done, other users may be blocked from getting bandwidth.

Putting on new interfaces

T-1/T-3 multiplexer makers are adding new interfaces to their already full stable.

Company	Interface
Ascom Timeplex	HSSI, ISDN PRI
AT&T Paradyne	ISDN BRI, ISDN PRI
Digital Link	HSSI
DTS	Ethernet
GDC	Ethernet, ISDN PRI, token ring
Larscom	HSSI
NET	Ethernet, HSSI, ISDN PRI, token ring
Newbridge	ISDN BRI, ISDN PRI
Racal-Datacom	HSSI
RAD	Ethernet, token ring
StrataCom	Ethernet, ISDN BRI, ISDN PRI
T3plus	Ethernet, HSSI
TyLink	Ethernet, ISDN PRI, token ring

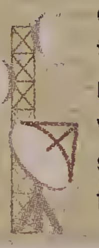
MANAGEMENT IMPORTANCE

Managing bandwidth is one thing, but managing the operation of the mux is quite another. With branch office applications requiring T-1 and even T-3 bandwidth, coupled with an explosion of features, muxes have become complicated networking nodes. And as they become more closely interweaved with the rest of the devices in the network that support a myriad of networking protocols and transmission types, integrated management becomes even more critical.

As would be expected, different vendors have chosen more or less aggressive strategies in integrating management features into their products. However, there are some basic management options each class of product should provide.

Hot-swappable modules are one of those features. If a port or processor card dies, users ought to be able to replace it without bringing down the entire mux. Almost every vendor offers this capability, but users should test the feature before buying the mux to make sure it actually works. Only low-end units that have few ports to begin with fail to support hot-swappable modules.

Several vendors, including Cray, GDC, NET, Racal-Datacom and RAD offer carrier-side connectivity to microwave and satellite feeds.



Also high on the list is the ability to downline-load management and configuration software from a central site to muxes strewn across remote locations. Without this feature, users may find themselves gaining frequent-flyer miles on one puddle jumper after another. Likewise, muxes should have the ability to downline-load operating system software upgrades to remote units.

Wideband and broadband muxes located remotely will require more frequent reconfigurations due to their more flexible configuration capabilities. So it's no wonder that only low-end units fail to supply this feature.

Muxes also need a network management port. This sounds like a simple requirement, but without one, there is no network management. Vendors have been improving their management ports of late, too. It used to be that muxes had an RS-232 administration port for the attachment of a management terminal. Now many of the LAN interfaces being plugged in to muxes provide management data across Ethernets and token rings. Configured correctly, these LAN-based management ports can pass data across external router or bridge links to a central site, enabling users to create somewhat of a poor man's distributed management environment.

A few products, such as Telco Systems' Route-24 and Larscom, Inc.'s Orion 4000 go as far as providing a dial-up management port, enabling central-site managers to connect to remote muxes and retrieve important information when the unit's primary WAN links are down.

There are more advanced features users should definitely consider worthwhile, even if an extra cost is included. These features include a proprietary management system console or an application that runs on top of so-called open management platforms such as Hewlett-Packard Co.'s OpenView, IBM's NetView/6000 and SunSoft, Inc.'s SunNet Manager.

Any mux maker of value offers a proprietary management system as well as support for leading open management platforms. The proprietary systems usually provide a much greater level of management for that vendor's products, but integration of management with other vendors' devices is difficult. This is a trade-off decision that each buyer must make individually: Go with the more powerful proprietary system or stay with less features supported by a multipurpose management tool such as OpenView or SunNet Manager.

If a mux maker is truly serious about management, it will support prewritten modules that run on OpenView, NetView/6000 or SunNet Manager, the leading SNMP management platforms. And many more have this capability today.

MANAGEMENT'S BEST

Nearly 75% of the products listed in the Buyer's Guide chart starting on page 48 are manageable from a proprietary element management system. A slightly higher number support SNMP and a leading open management platform. OpenView is by far the most often chosen platform, with NetView/6000 and SunNet Manager coming in second and third, respectively. Common Management Information Protocol support is still very much lacking, especially for muxes that interact directly with carrier services.

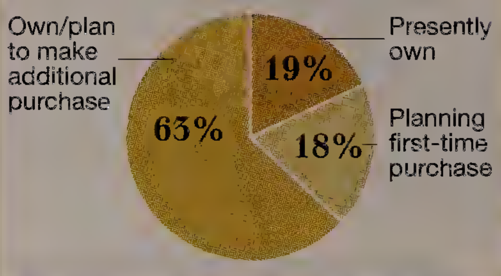
The biggest CMIP supporter is NET, which

Continued on page 54

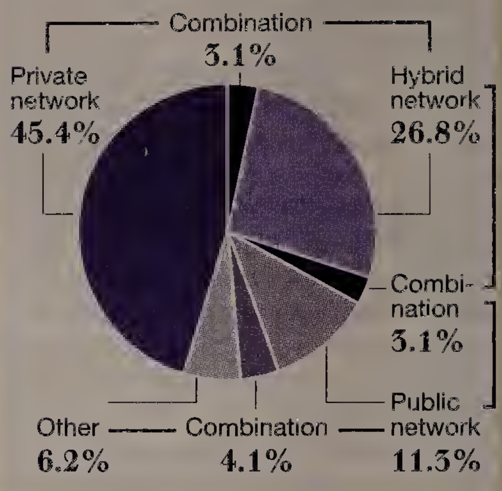
Reader views on T-1/T-3 multiplexers

Based on 100 interviews.

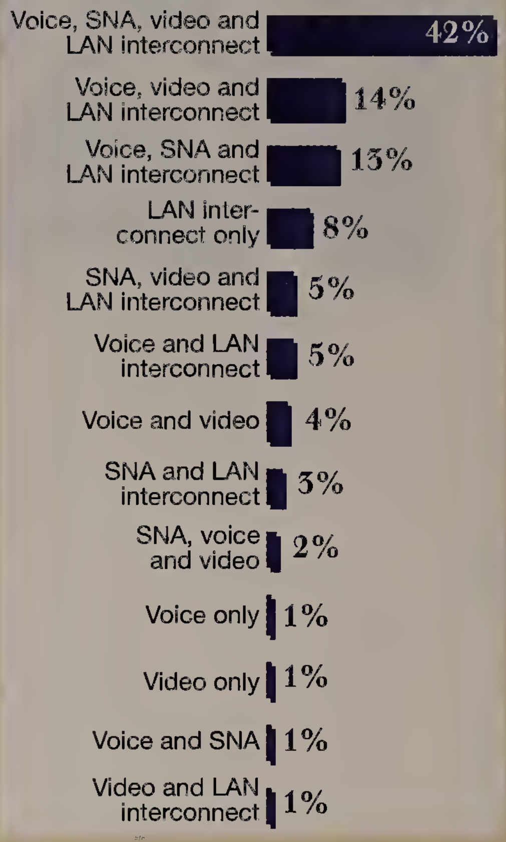
How many T-1/T-3 multiplexers do you own/plan to buy in the next 12 months?



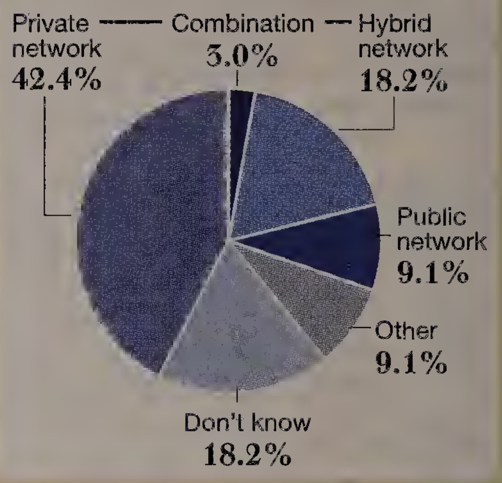
Do/will you use your T-1 multiplexer as the primary interface to a private network, public network or a hybrid private/public net?



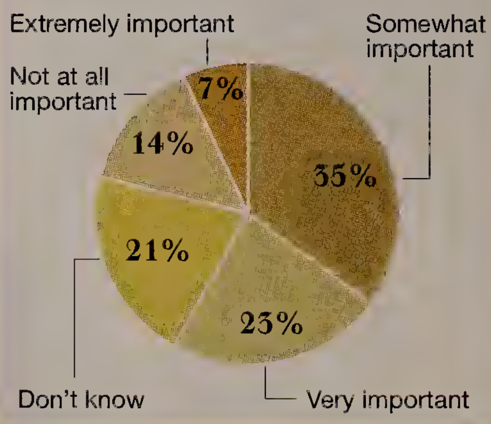
Types of traffic T-1/T-3 multiplexers support/will support:



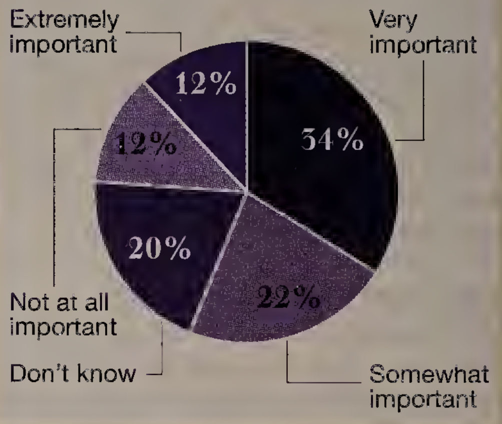
Do/will you use your T-3 multiplexer as the primary interface to a private backbone, public network or a hybrid private/public net?



How important will an architecture based on TDM be to your purchasing decision in two years?



How important will an architecture based on cell switching be to your purchasing decision in two years?



Key T-1/T-3 multiplexer selection criteria

Based on highest possible ranking of 9.

Hot-swappable components	8.23
Variety of circuit allocation methods	7.47
High-speed data service interfaces	7.13
Integral LAN interface	6.76
Nx64 inverse multiplexing	6.25
NxT-1 inverse multiplexing	5.90
Integral routing/bridging	5.80
High-speed data terminal equipment interfaces	5.63
Integral ATM switching	5.60

Focus Data, Inc., an independent market research firm in Framingham, Mass., conducted this survey. Focus Data specializes in gathering primary data from end-user organizations regarding their enterprise network environment and needs. For more information about Focus Data services, call Mona Dabbon at (508) 626-2556.

GRAPHIC BY SUSAN SLATER

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AT&T Paradyne

Based on IDC Key Influencers in the Purchase of Digital Access Equipment, August 1994.

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Continued from page 52

offers CMIP on its five IDNX models.

A handful of vendors have added advanced management features that set them apart from the others.

T3plus' products offer an integrated SNMP agent at no extra cost and can be managed from OpenView, NetView/6000 or SunNet Manager. The company also offers BMXView, a Unix- and SNMP-based proprietary network management system.

Additionally, BMX models offer dynamic bandwidth allocation and control of all major configuration parameters.

Newbridge's 3600 MainStreet Bandwidth Manager and 3645 MainStreet Bandwidth Manager are the only products listed in the Buyer's Guide chart that support all four popular management protocols — SNMPv1, SNMPv2, CMIP and IBM's NetView — plus the Remote Monitoring Management Information Base (MIB).

Newbridge also offers the proprietary 4602 MainStreet network management system with a MIB walker, a facility that lets users read or write any MIB object to an SNMP node on a personal computer-based system called 4601A, and a terminal interface for maximum management flexibility. It also has an SNMP proxy agent for its frame relay modules.

All of NET's IDNX models deserve praise for their management functionality. NET was one of the few vendors — along with Newbridge and RAD — to support the SNMPv2 standard, which offers greater security, manager-to-manager communications and bulk operations for retrieving a batch of management data or setting a bunch of operation parameters with one command. The firm also supports the CMIP and NetView protocols, as well as its proprietary NetOpen 5000 management system, which provides fault isolation, recommends corrective action and creates trouble tickets.

INTEROPERABILITY

Management can make or break a purchase decision, but unfortunately, it's tougher to use interoperability to differentiate products. The scenario is pretty simple: Access muxes interoperate with any other product that supports their required framing standards, such a DS1 signaling for T-1 and D4 for channel banks. Broadband and wideband muxes, however, usually fail to interoperate with other vendors' muxes but will do so with other networking devices such as routers, private branch exchanges and central office switches.

Integrated access advantages

- ☑ Less equipment on the user's site.
- ☑ Fewer access lines are needed.
- ☑ User can quickly add interfaces and provision services without taking down the physical network.

SOURCE: INTELLIQUEST, AUSTIN, TEXAS

The underlying reasons are fairly simple, as well. Access muxes are mostly used to send information over a basic carrier circuit with little or no value added. Broadband and wideband muxes, on the other hand, anchor private networks that support a mix of advanced, specialized features that require each mux in the net to come from the same vendor.

As expected, vendors have figured out that some buyers are building hybrid public/private networks. These hybrid networks require broadband and wideband muxes that will be able to route information within the private networks using any protocol the vendor prefers, as well as to and from the public services. T3plus, Netrix, TyLink and NET provide this type of standard interoperability with their high-end muxes.

THE FUTURE CHOICE

Even with the recent improvements in muxes, users have to tread carefully in counting them among the strategic purchases in the next few years. Users can wait the two to three years it will take for ATM to mature and become a commercial reality, or continue to put muxes in place.

That decision will get tougher in the next five years, when ATM services will be easily available in most major metropolitan areas and ATM switch features approach those of current muxes, including the ability to handle voice.

On the other hand, ATM is primarily an untried technology, and the mux vendors have been able to demonstrate their capabilities to mix voice and data while maintaining the necessary performance to support their existence.

As technologies such as ATM become more prevalent, the old mux workhorses will continue to be retrofitted to maintain concurrency with the capabilities of the carriers, but they will not match ATM on every front.

Muxes may not be the streamlined Porsches that ATM switches promise to be, but they certainly may become old Dodge Darts retrofitted with jet engines.

➡ Glassford is manager, Hurley is a senior consultant and Liu is a consultant with Ernst & Young's Technology Services Group in Fairfax, Va. They can be reached at (703) 903-5000.

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Putting the user back in user groups

Hungry to bolster membership, groups make drastic changes to respond to users' time and money constraints.

BY JOANNE CUMMINGS

Network user groups, which were self-styled to cater to the needs of professional managers, are falling out of favor. In a world where layoffs are commonplace, downsizing is the norm, and job security is a quaint notion, users say groups like the International Communications Association (ICA) and Tele-Communications Association, Inc. (TCA) just aren't a priority anymore.

In the past, typical communications professionals belonged to several groups, depending on their corporate background and interests. But with today's tight budgets and schedules, most users are lucky if they have the time and availability to join even one organization. Instead, they attend occasional group meetings almost on a tactical basis — only if the agenda is strictly focused and pertains directly to their immediate needs (see story, page 56).

But in their rush to save time and money, users may be overlooking a valuable strategic resource. Not only are user groups chock-full of concrete opportunities for networking with peers, but they also can serve to repair damage left by the budget ax. For example, user groups can provide technical and managerial educational seminars, easing the burden on the corporate training budget. And many of the larger groups also offer regulatory clout at both the state and national level, leverage that can directly impact the corporate bottom line. For their part, many groups are undergoing drastic changes in an effort to be more responsive to users and to woo members back into their folds.

Users with diverse networking environments would probably be better off belonging to a general-purpose group like the ICA or TCA, while those in a single vendor environment would benefit most from a vendor-specific group like the Association for Banyan Users International (ABUI). For others, a regionally focused group like the Communications Managers Association (CMA) in New York or an industry-specific group like the Wall Street Telecommunications Association (WSTA) for the financial industry may fit the bill. But they all have their pros and cons, according to analysts and users.

"The value you get out of a user group will probably be the greatest if you can focus your attention either topically or regionally," says Thomas Nolle, president of CIMI Corp., a network consultancy in Voorhees, N.J. "For example, [IBM's] SHARE is a good user group for someone who is [in] an IBM mainframe organization. Because the interest of everybody in the group is so tightly focused, the exchanges within the group are valuable to everybody."

USER GROUP FLAVORS

The same holds true for a regionally focused group. The CMA, for example, is a successful regional user group because all of the members can interact easily with one another since they're all from the same general geography. "They get to know one another, and their relationships can be tighter and more continuous than in a user group that has to draw from a national constituency," Nolle says.

Such physical proximity also saves time for CMA members, according to Al Bieber, the CMA's outgoing president. (This month, Tom McCarthy took over the CMA reins.) "CMA is continuing to prosper primarily because its focus is regional," Bieber says. "It has the benefit of Fortune 500 membership, and that membership can reach the conference by getting on the subway. They can participate for half a day if necessary, carry a beeper and be back in their office in a half hour flat. So from that standpoint, we prosper whereas other organizations that require travel and are of a similar nature to ourselves, like ICA and TCA, may be hurting."

In addition, regional groups are better equipped to deal with problems common among members. "They usually have the same labor pool they're drawing from, so they have the same personnel issues and so on," Nolle says.

For some users though, regional and vendor groups can be a little too specific. The fact that they are so specialized can mean that users with heterogeneous nets will be forced to belong to many different groups, voiding any time/cost savings.

A rule of thumb for vendor-specific groups is to concentrate only on

Continued on page 56

Pictured from top: Gus Bender, John Faccibene, Ted Kull, Rebel Kreklow and Al Bieber

Continued from page 55

your major product areas, such as network operating system or database products, according to Wayne Eckerson, a senior analyst at Patricia Seybold Group, Inc. in Boston, who adds users may also opt to take a shorter term view of user group membership.

"Technology changes so fast that people should try to concentrate on just their major software or hardware groups and not be averse to changing them when the situation warrants," he says.

THE BIG PICTURE

Another way around that situation, however, is to join a more general-purpose group like the ICA or TCA.

"If you join an organization, you need to consider your networking advantage," says Rebel Kreklow, the TCA's corporate president. "For me, being in the TCA, every time I put in a new phone system, I can go out and do a review of TCA members who have the same equipment, and they can tell me the problems they may have had."

Another plus is that larger groups tend to provide a larger say in the regulatory arena. Both the ICA and TCA spend resources making their members' opinions known at both the state and national level, and both groups point to issues in which their actions have made a difference to their membership.

"The ICA membership represents $17 billion per year in purchases of information technology products and services," says Gus Bender, chairman of the ICA board of directors and second vice president of The Travelers Insurance Co. in Hartford, Conn. "The public policy work we do saves each member corporation, on average, $6 million in expenses."

The ICA membership represents $17 billion per year in purchases of information technology products and services. The public policy work done by the ICA saves each member corporation an average of $6 million in expenses.

SOURCE: GUS BENDER, CHAIRMAN OF THE ICA BOARD OF DIRECTORS

In addition, larger groups tend to offer a broader base of educational opportunities. Whereas ABUI's annual conference may be limited to learning about Banyan Systems, Inc. products and how they interact with other vendors' wares, groups like the ICA and TCA offer more broad-based sessions in areas like management training, as well.

The TCA's Kreklow says TCA members not only have the opportunity to learn about new technologies, such as Asynchronous Transfer Mode, but a large percentage of its educational offerings center around topics such as managing people and developing budgets. "We're interested in the more broad professional development of the membership," he says.

Such advantages, however, are not limited to the large general-purpose groups. Smaller, more focused groups like the WSTA and CMA offer similar educational programs, as well as wield considerable power at the state public utility commission and congressional levels.

"During the NYNEX strike a few years back, WSTA used its clout to get service installations [quickly]," says WSTA President John Faccibene. "The purchasing power of the collective members of even a group our size can be leveraged to get certain price/performance."

THE CONS

The problem with the larger, general-purpose groups is that they are less focused, and, as a result, a larger percentage of their activities may not be pertinent to every member.

"Organizations like the TCA and ICA have struggled in recent years and will continue to struggle because their programs are so diffused," says CIMI's Nolle. "The larger you get, the more diffused your program has to be because the interest group that you draw from is larger. And the more diffused your program is, the larger a percentage of it is inapplicable to a given person."

For example, Nolle says a more tightly focused group could offer a conference with 65 tutorials, most of which directly pertain to all of its members. But a larger group with a more diverse membership may need to offer 650 sessions, 95% of which do not pertain to a given member.

Also, the larger they get, the more these groups are forced to rely on vendor funding and the more likely they will be unduly influenced by those vendors. "That's the problem the large organizations face — the fact that they become increasingly dependent on commercial sponsorship simply to survive," Nolle says.

Groups such as the ICA and CMA are starting to bring vendors into the organization as a way to offset costs. According to the CMA's Bieber, these vendor companies cannot vote or decide the policy of the organization, but they can run nongeneric seminars for the members. In return, the vendors provide financing that can be used to offset the organization's expenses, such as paying for a lunch at a business meeting. The TCA, however, does not permit vendors or consultants to be members.

In addition, larger groups may not have the ready access to a vendor that a vendor-specific group can provide.

"Users should look at how the group is organized to ensure that they'll have a say," Patricia Seybold's Eckerson says. "They should make sure there's an avenue for direct access to the vendor." For example, does the vendor assign a liaison to attend every meeting of the group? Is information, both on current products and future directions, readily accessible to the group via a formal process?

Another caveat in considering joining a larger group is that much time is devoted to nonessential activities, Eckerson says. "Watch out for bureaucratic types of groups," he says. "If there's an elaborate ritual of [electing] officers and so on, there's going to be less time spent on actual technical discussion."

Yet another problem with user groups is that there's a certain amount of personal ambition involved. "There are people within organizations who desire to be seen as kingpins in the industry, and they see the organization as a springboard to that happening. I'm sure there are people on the inside of TCA and ICA who will give you some names of individuals who fit in those categories," Nolle says.

ECONOMY A FACTOR

The larger groups like the TCA and ICA are having a hard time keeping members despite the pluses of diverse membership and regulatory clout. As a result, they're searching for

Users on user groups

"Why don't I join one? The four-letter word we all know and love, and that's 'time.' That's my main reason. I spend enough time at work, and when I get out, I sure don't want to go and listen to a bunch of people talk about more work stuff."

Larry Lemay, network engineer, Computer Language Research/FAST-TAX, Inc., Carrollton, Texas

"We don't belong to a user group, but we have people who attend vendor-specific user group meetings. For example, with software, if you buy it, you get invited to the user group meeting. So we're able to evaluate a vendor quickly that way."

William Connor, corporate vice president and director of information technology, Motorola, Inc.'s General Systems Sector, Arlington Heights, Ill.

"I haven't found your average vendor user group to be very useful. The people in my organization find that industry-specific trade shows are the most valuable things we attend. It is useful to talk to other users and find out why people make certain choices and so on, but as far as making a big deal of attending quarterly meetings or that sort of thing, we just don't have the time. I think more business gets done via individual contacts vs.the user group itself."

Peter Bates, systems vice president, Esprit de Corps, San Francisco

"If I had the time or if something caught my interest, I might think about joining a group. But I'm afraid it would be a lot like the experience I've had with [Certified Novell Engineers]. I have encountered CNEs that don't know anything, who went in, read the book, took the test, passed and spout knowledge without any backup. I'm afraid that a user group is going to be filled with people very similar to that. They might not know what they're doing, and I might not get any value out of it."

Paul Badowski, computer applications specialist, BellCan Engineering Group, Inc., Cincinnati

Groups of note

A list of user groups that responded to *Network World* queries.

Group	Location	Contact number	Charter	Current leader	Number of members	Annual company membership fee
Association of Banyan Users International (ABUI)	Chicago	(800) 730-2284	National vendor-specific group aimed at users of Banyan products, especially the VINES network operating system.	Ted Kull, president	2,100	$150
Communications Managers Association (CMA)	New York	(201) 425-1700	General-purpose, regional group primarily for New York and eastern seaboard. Some regulatory issues, but focuses mostly on education.	Tom McCarthy, president	200	$600
Energy Telecommunications and Electrical Association (ENTELEC)	Dallas	(214) 235-0655	National industry-specific group for energy firms such as public utilities.	Benny Martin, president	170	$300
International Communications Association (ICA)	Dallas	(214) 716-4124	General-purpose, broad-based, international in scope. Focuses on education and regulatory affairs.	Gus Bender, chairman of ICA board of directors	600	$750
International SL-1 Users Association (ISLUA)	Dallas	(800) 274-7582	National vendor- and product-specific group aimed at users of Northern Telecom's SL-1 PBX.	Gail Misener, president	4,000	$50
National Centrex Users Group (NCUG)	Neenah, Wis.	(414) 751-1244	National product-specific group aimed at Centrex users.	Sharon Dolly-Greiner, president	1,800	No fee
TeleCommunications Association, Inc. (TCA)	Ontario, Calif.	(909) 945-1122	General-purpose, broad-based, national in scope, although membership tends to be limited to western U.S. Focuses on education and regulatory affairs.	Rebel Kreklow, corporate president	900+	$125-$200, depending on local chapter
Wall Street Telecommunications Association (WSTA)	Red Bank, N.J.	(908) 530-8808	National industry-specific group for the financial industry, although membership is primarily New York-based.	John Faccibene, president	800	$300

ways to become more responsive to their membership, ensuring that they will still be a valuable tool, especially in these economic times.

"Economic conditions are impacting us," says the TCA's Kreklow. "Before, people may have belonged to three or four associations, but now they're being told by management to cut the budget."

He offers the example of a communications manager of a small college. The manager may have belonged to the Association of College and University Telecommunications Administrators (ACUTA), the TCA and the National Rolm User Group, because that was the phone system in place on the campus.

"Now he is being told to choose one, so which is going to give him the best bang for his dollar?" Kreklow asks. "ACUTA, because it's strictly colleges and universities? TCA, because there's a broader base of regulatory support and education? Or does he go with the Rolm group because that's what he's using now and that's what he's really interested in?" With time and money so key, decisions like that become more crucial, he says.

The ICA's Bender admits his group has seen a drop in membership, as well.

"The ICA has seen more membership turnover the last couple of years," he says. "That's probably fostered by corporate mergers and downsizing as much as anything else. We are still getting a lot of new members coming in, but we've got a lot of memberships not being renewed, and that's primarily because the firms don't exist anymore or have really downsized."

According to a recent internal survey, TCA members say their primary reasons for joining the group are peer networking, education and vendor product familiarization.

Even vendor-specific groups have seen a change in membership.

"We've noticed conference attendance has flattened out," says Ted Kull, president of ABUI and project manager for systems engineering at Educational Testing Services in Princeton, N.J. "I think that reflects people not wanting to travel, and, of course, some is due to the economy."

DOWN BUT NOT OUT

As a result, many groups are making drastic changes in their programs. For example, in recent years, the ICA has been unable to attract a large enough number of vendors to its annual conference and exhibition. Thus, starting in March of 1995, the group's annual meeting will be held in conjunction with SuperComm, a large vendor-sponsored trade show in Atlanta.

"The ICA members say the most important thing is their quality time with exhibitors on and off the exhibit floor," Bender says. "And the ICA Expo certainly was not large enough to meet the needs of its membership. But by collocating with SuperComm and running one large exhibit, we will have presented to our members and attendees close to 500 exhibitors and well over 20,000 square feet of exhibit space, compared with the previous year, which was about 7,500 square feet."

The TCA's Kreklow says he believes the groups are stretched too thin and should look to form association coalitions. "Looking into the future, there's a possibility that if the pay-for-profit shows [such as SuperComm and Net-World+Interop] continue, conceivably there could be a multiassociation show somewhere down the road," Kreklow says. "Let's say a TCA/ICA/CMA show"

"We're going to have to take a hard look at the way we do business, and pooling our resources may make sense," he says. "I'd like to see TCA become a lightning rod for other associations so that when we have our conferences, we provide booth space and meeting rooms for other user groups and associations. And I would hope other associations would think, well if we're going to have a meeting this year, why not have it in San Diego? That benefits them because they have free space, and it benefits us by bringing other attendees in."

IT MAKES CENTS

Thus, users tempted to forego user group membership because of a perceived lack of time or cash, should take a second look at the organizations out there. With waning membership in recent years, these groups have keyed into becoming a more valuable resource to their memberships and are providing services, such as education, networking with peers and regulatory clout, that users are hard-pressed to procure elsewhere.

And no matter which group a user ultimately decides to join, the long-term benefits of membership are sure to offset any short-term expenses in time and money. In many cases, the amount of hours and dollars spent at user group activities is more than reimbursed in kind in the long run.

➻ Cummings is a free-lance writer in Marlborough, Mass. She may be reached at (508) 481-6061.

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In-box

Continued from page 45

interleaves them with other cells onto the channel to the PBX. If these cells have a constant bit rate, the switch will have already reserved enough bandwidth on the outgoing channels.

The only problem occurs with variable bit rate traffic (for example, a typical data transfer to or from a PC), which is random in its arrival rate at the switch.

It is possible that too many incoming cells will arrive at the same time without corresponding outbound bandwidth, producing congestion.

Then either the cells wait in buffers or get thrown away — as is the case with all of today's packet switches, including routers, frame relay assembler/disassemblers and multiplexers.

Congestion management is a well-understood problem, common to all X.25 and frame relay networks (and now becoming a problem for router internets).

The ATM Forum is actively working on congestion management processes so that all users can politely cooperate and ensure that no data is lost.

There is no practical reason why ATM can't be used at any speed; access devices are available that support cell relay at 9.6K bit/sec. As long as the nearest switch can merge these cells into a faster pipe to the next switch, all will be well.

It is exactly this flexibility that is so attractive; your 10M bit/sec variable bit rate connection could be carried over fiber, LAN cable or WAN cable (at T-3 to OC-12 speeds) and delivered at 10M bit/sec to a file server anywhere in the network, without speed or protocol conversion.

Peter Thornton
Account manager
WilTel Data Network Services
Edison, N.J.

Still alive

First, I'd like to applaud Adam Gaffin's reporting on the recently announced alliance between Hewlett-Packard Co. and Lotus Development Corp. to produce an integrated, enterprise-strength messaging and groupware solution (Nov. 14, page 3). I'd also like to express my concern about Mike Rothman's column on the alliance, which appeared in the same issue (page 58).

Mr. Gaffin reported on the details of the agreement and also took the time to interview HP OpenMail customers. The customers interviewed expressed a favorable reaction to the announcement.

From Mr. Rothman's piece, titled "Ding, dong! OpenMail's dead," it is obvious he considers what he characterizes as his "humble opinion" to be more important and accurate than the opinions of current OpenMail customers.

His ire was vented against HP's strategy to work to provide users with a future, integrated product based on the leading groupware solution, Lotus Notes, and the leading enterprise-strength, client/server messaging solution, HP OpenMail.

HP will continue to develop, enhance and market OpenMail. Our customers have seen a plan that illustrates HP's continued support and investment in this product, and they are pleased with what they see.

I'm sure, given Mr. Gaffin's article, that your readers can depend on responsible reporting and view Mr. Rothman's editorial as mere personal opinion.

Korak Mitra
Business manager
Enterprise Messaging Operation
HP
Cupertino, Calif.

Rothman's response: I declare that my first column is a success. Based on feedback I've gotten from both META Group, Inc. clients and NW *readers, I've made users think about the long-term viability of OpenMail. I'll concede that HP isn't pulling the plug on OpenMail in the short term, because they never really kill anything — they just put it out to pasture, presumably to stud or something.*

My position has not changed; I still view OpenMail as a tactical *messaging-only solution with a limited life expectancy unless HP can turn develop OpenMail as a center-of-gravity messaging platform, aligning third-party independent software vendors to build useful OpenMail applications. HP has not been able to do this over the past 18 months when they had no competition, so I have no reason to believe HP has the marketing prowess to do it now.*

It's not my job to solicit opinions from OpenMail users; I'm an analyst, not a reporter. An analyst offers opinions and recommendations based upon his or her assessment of the marketplace and how it will change over the long term, which I did, and stand behind it.

Let us know what you think

Letters must include your name, title, company, city, state and a daytime phone number for verification. All letters are subject to editing for space and clarity. Letters can be mailed to Editor, *Network World,* 161 Worcester Road, Framingham, Mass. 01701, or sent via fax to (508) 820-3467 or via the Internet to network@world.std.com.

Help desk

Continued from page 2

Technologies by phone at (415) 988-4848 or via the Internet at info@lat.com.

I heard there are Internet list services available where Novell, Inc.'s NetWare users can exchange ideas and report network problems and bugs. Can you tell me how to access these services?

Juan Segura, Bronx, N.Y.

Ron Nutter, a network systems engineer at IntraSource, Inc., a Novell Platinum-authorized reseller and service center in Lexington, Ky., replies:

There are two possibilities for exchanging NetWare ideas on the Internet. One option is to subscribe to the Novell listserver by sending E-mail to listserv@suvm.bitnet. In the body of the message, type: SUBSCRIBE novell [your name].

You will then receive all messages that are sent to this list. You can reply to those messages, and all other Novell list subscribers will see your message.

Another option is to use a newsgroup reader program to read and post messages on the Usenet newsgroup comp.sys.novell. There might be some duplication of messages between the Novell listserver and the Usenet newsgroup; some users post the same messages to both.

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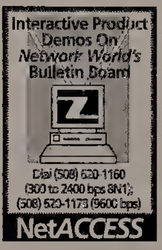
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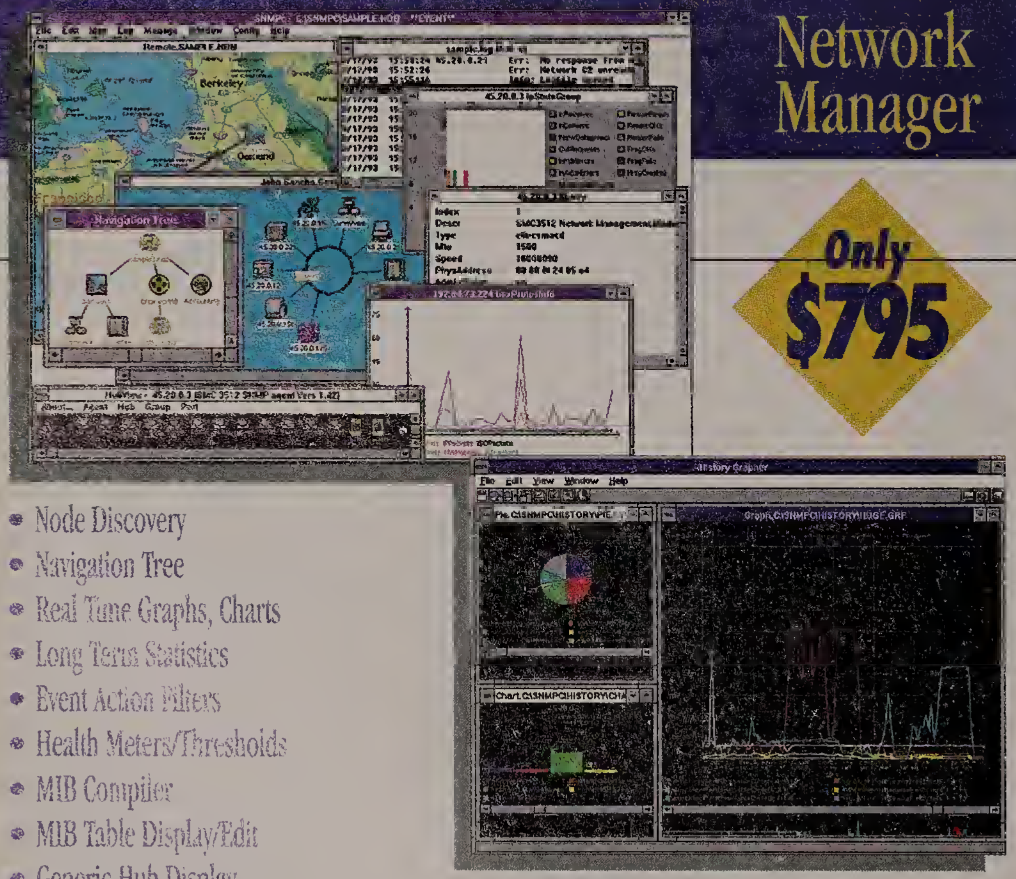

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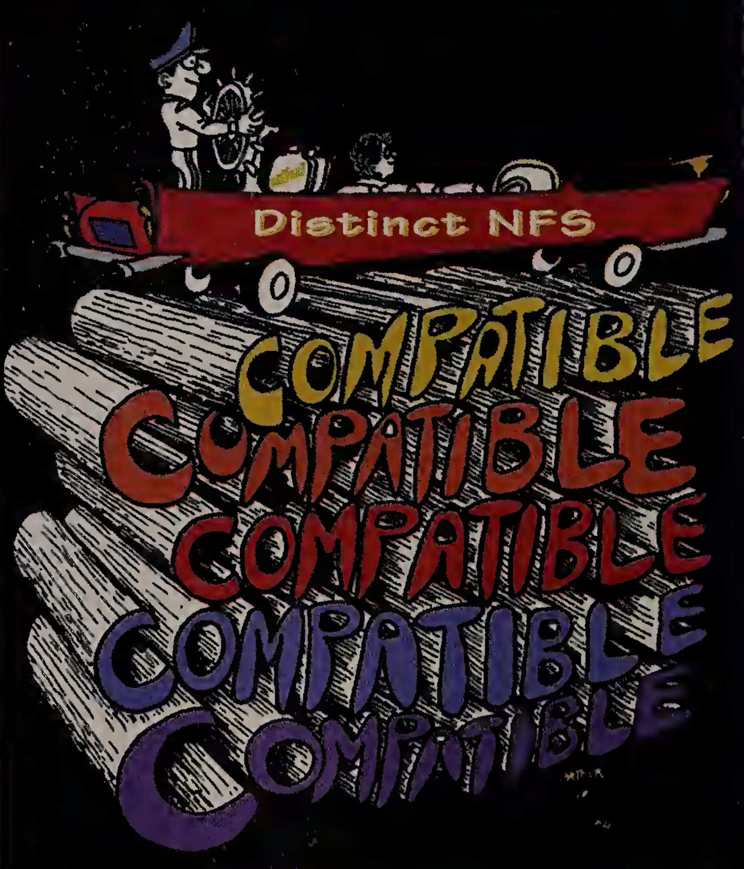

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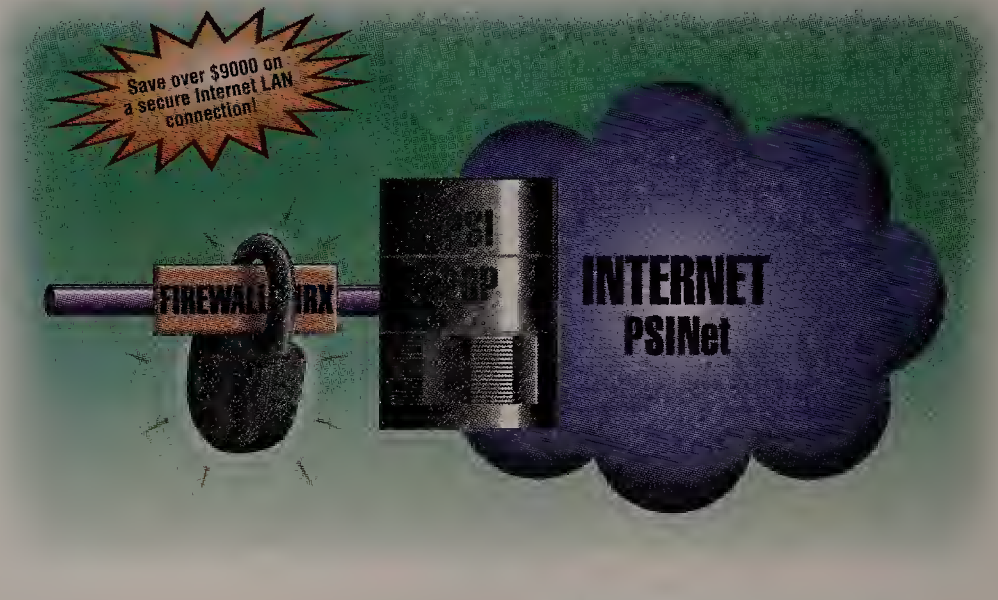
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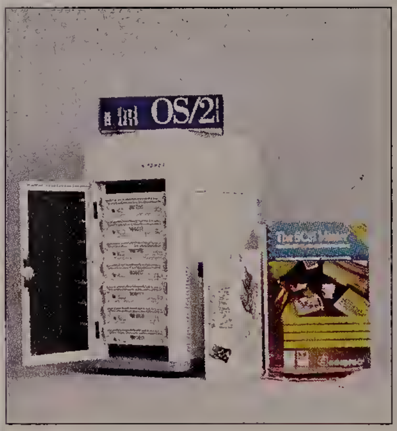

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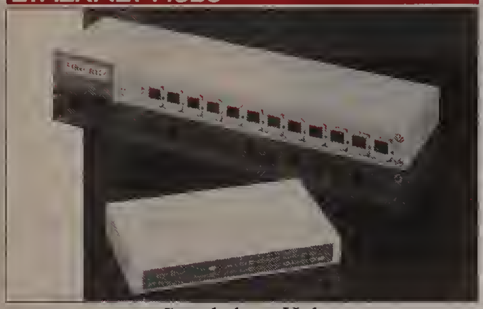

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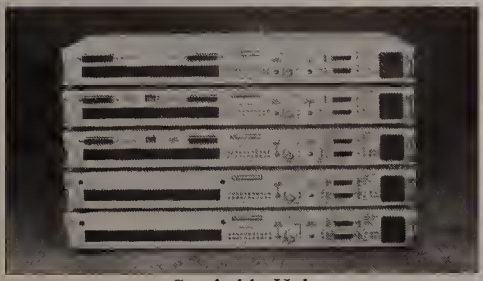

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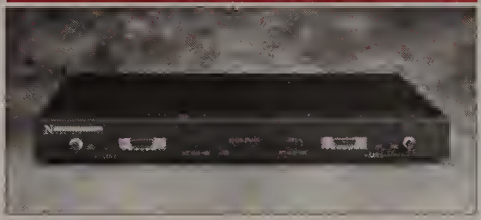

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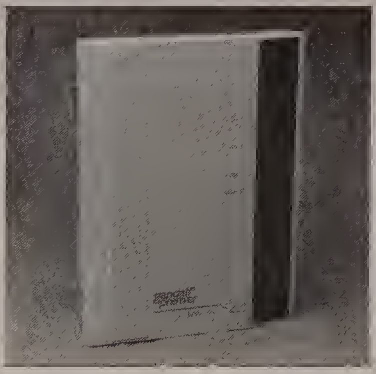

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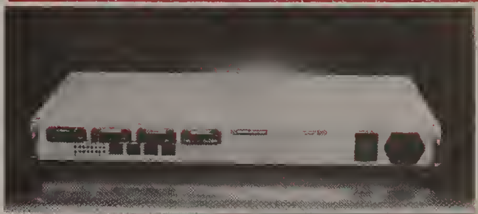

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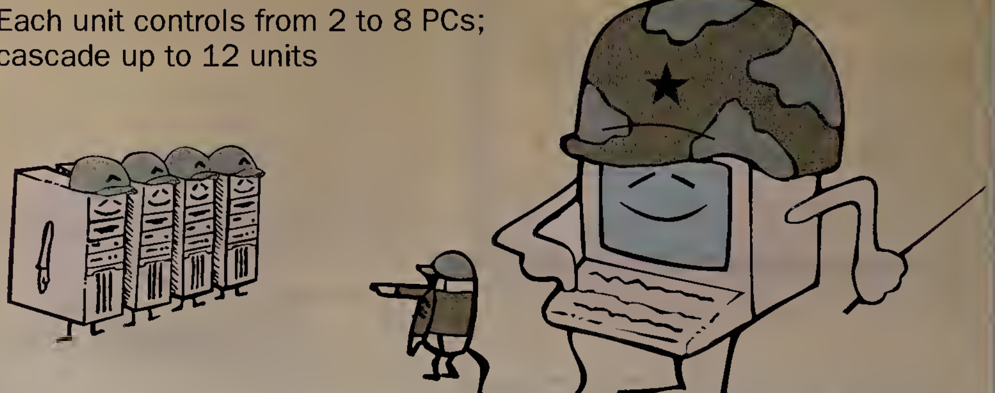

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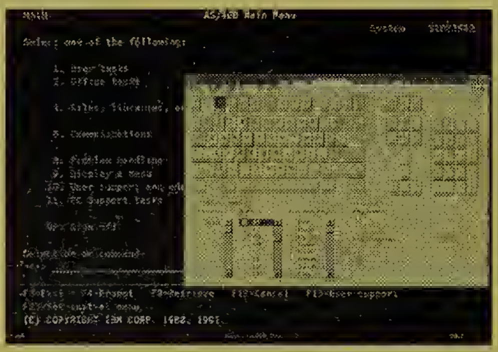

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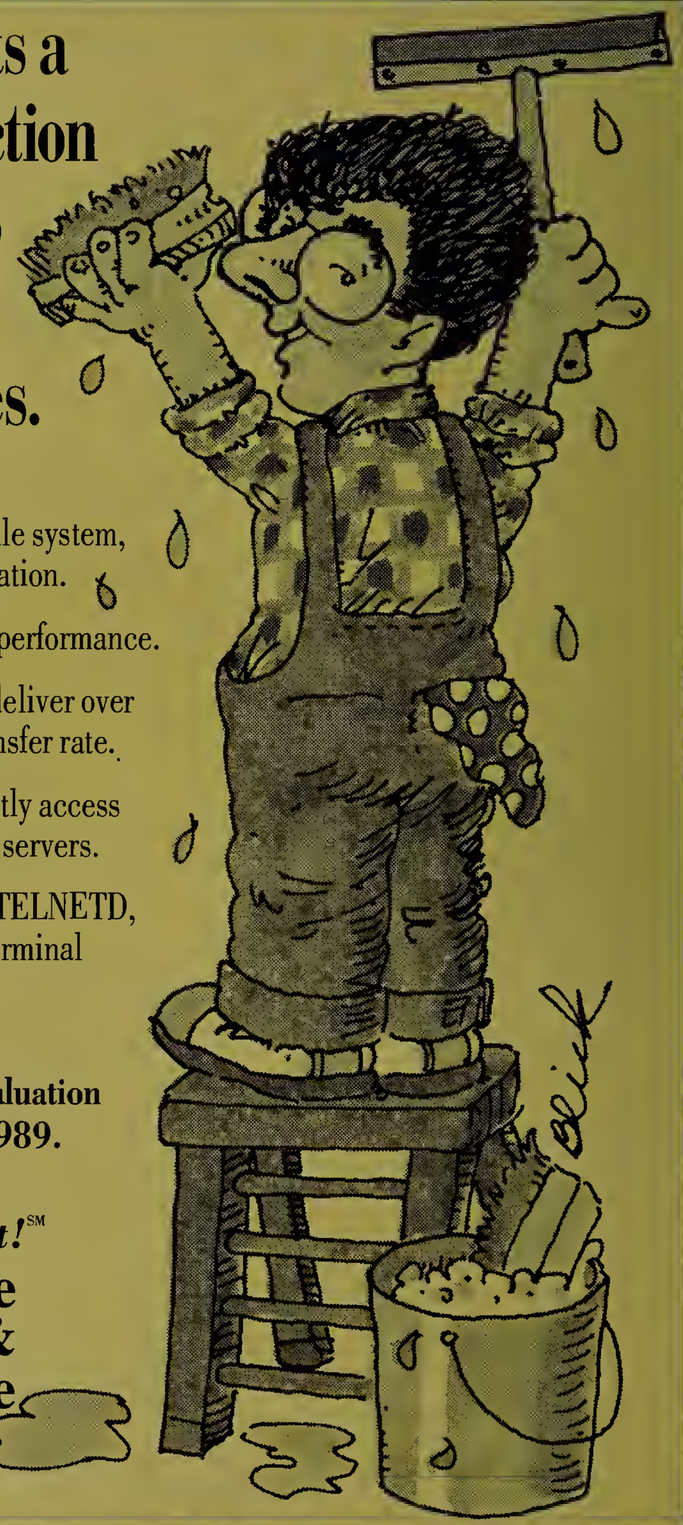

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TCP/IP Networking - Circle #111

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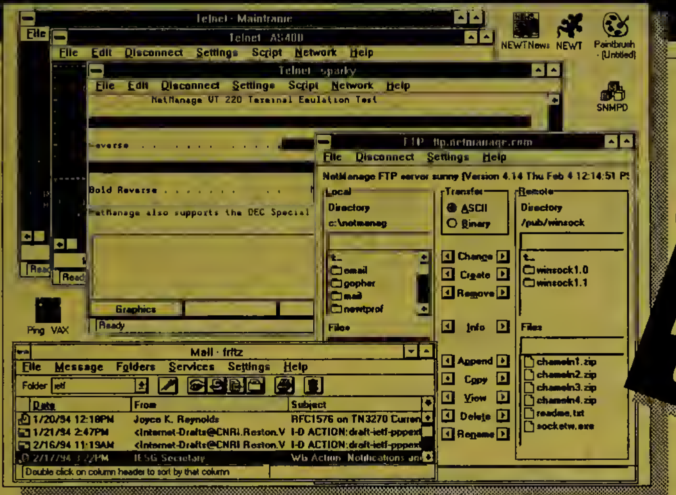

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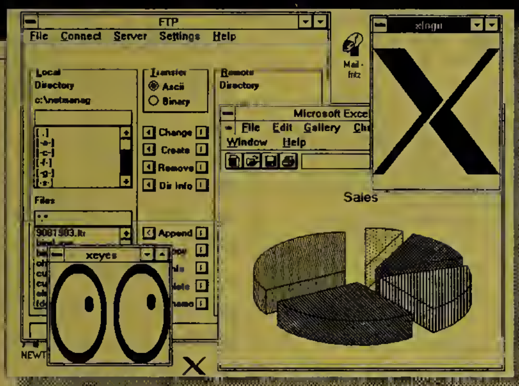

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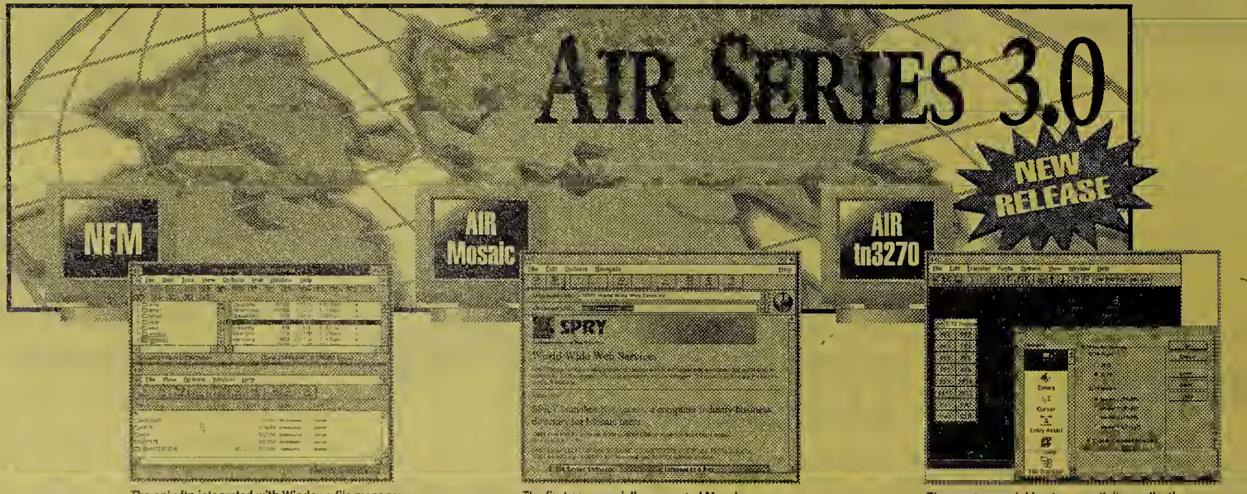

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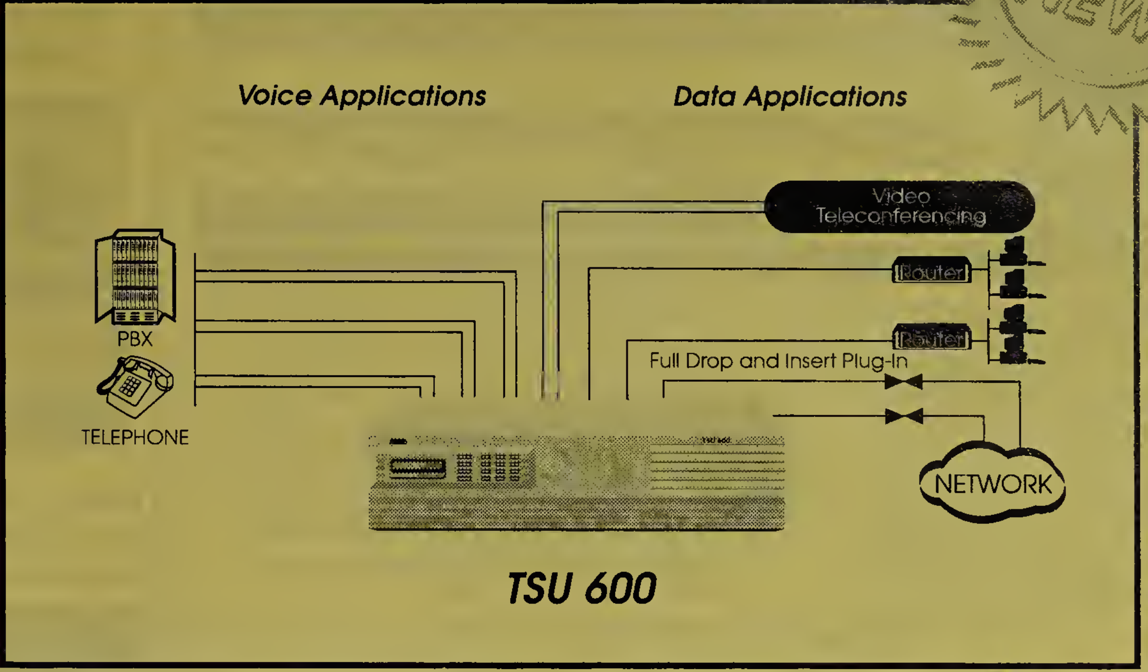

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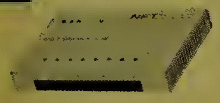

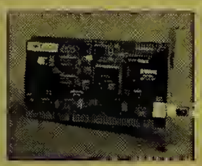

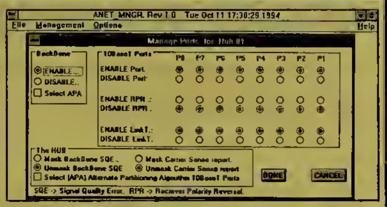

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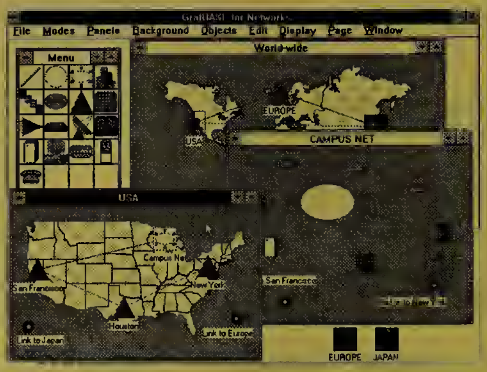

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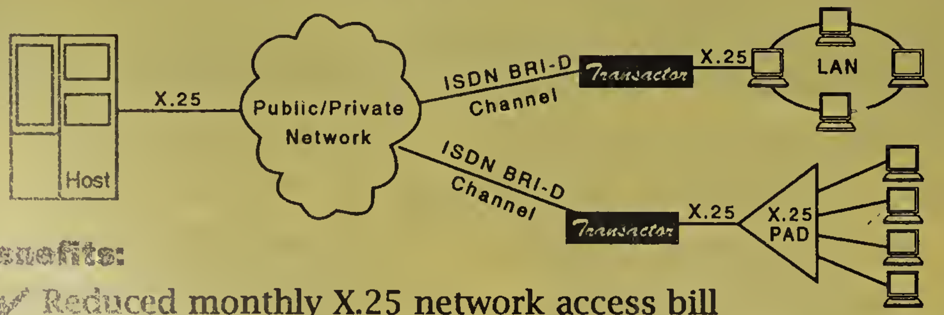

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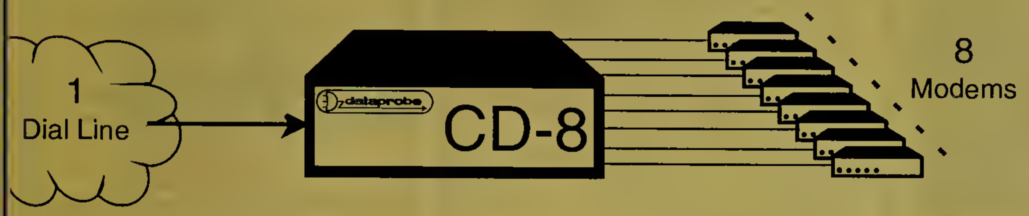

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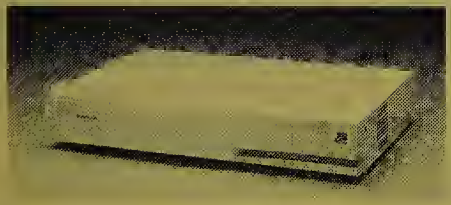

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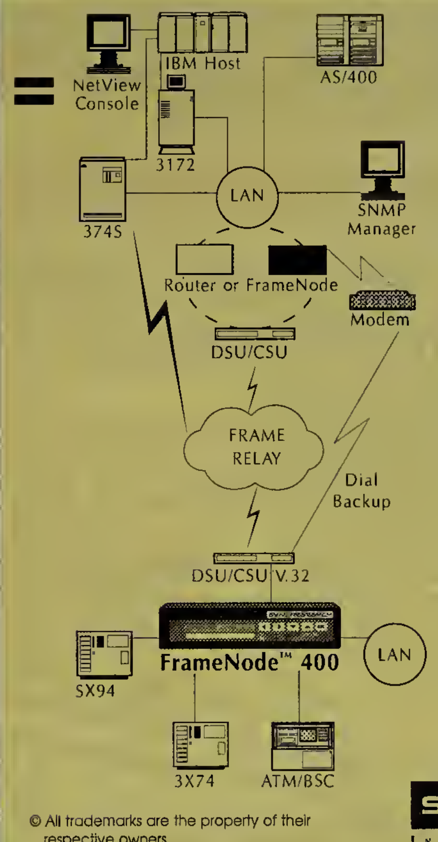

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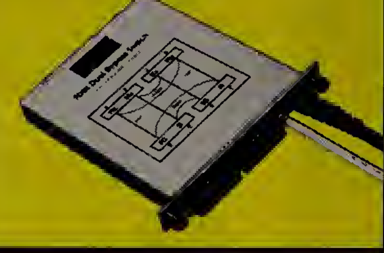

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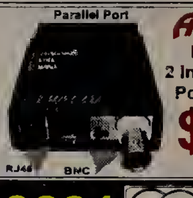

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NetWare

Continued from page 1

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The Home Page kit will also provide links to Novell's GroupWise groupware product, allowing users to access data in GroupWise or join discussions. The kit provides templates of text, graphics and video clips that users can modify as needed.

Templates are an effective way to create home pages but less flexible than the ability to create a document in a word processor and convert it to the Hypertext Markup Language (HTML) Web page format, analysts said.

Microsoft, for example, has announced that an upcoming version of Word for Windows will convert documents to HTML. Novell is also working on an HTML-capable version of its WordPerfect word processor, but has not set a data for its release, Leporace said.

Novell will begin selling late next year a server-based package called InterNetWare that will include the Corsair Web browser, a TCP/IP stack, and a menu of Internet navigation and IP management tools.

Once launched, InterNetWare will download to a client a TCP/IP stack and such utilities as news readers and data access applications. Users will be able to run TCP/IP and IPX simultaneously from their desktops in concurrent sessions, using TCP/IP to access their Internet provider or any Unix server while employing IPX across the LAN, Leporace said.

When users are finished with the TCP/IP stack, they can delete it to save memory, and access it again from the server as needed, Leporace said. InterNetWare takes about 20K bytes of base memory and 2M bytes of random-access memory. Users can also store it on their hard drives in about 2M bytes of space, Leporace said. In addition, InterNetWare provides a bulletin board capability that could be used to set up internal corporate newsgroups.

Novell is also enhancing its existing TCP/IP stack, LAN Workplace, by adding an Internet E-mail application.

It will add support for the Simple Mail Transfer Protocol and Post Office Platform V.3 E-mail protocols, and the Multipurpose Internet Mail Extensions multimedia protocol.

The mail product is aimed at heavy TCP/IP users and at Unix users who don't need or want to run NetWare, Leporace said.

But Novell won't likely have a lock on Internet access, even for heavy NetWare users, said the network manager of a major clothing retailer, who asked to remain anonymous.

The retailer is looking at connecting its 3,000 NetWare users to the Internet but is using a TCP/IP stack from IBM because "[Novell's] LAN Workplace just doesn't work well in our environment," which includes OS/2, DOS and Apple Computer, Inc. Macintoshes.

Microsoft

Continued from page 1

changes from Dallas-based InteCom, Inc.

Under the network, turned on last month, AT&T sends all Microsoft 800 calls to a single main PBX here. The PBX continuously collects customer and agent information fed to it from around the country, enabling it to quickly identify the next available qualified agent to deal with incoming calls.

In the process, Myall has achieved something that would be impossible for AT&T or any other single carrier to do. He has taken regular local and toll calls — which, unlike 800 calls, involve dozens of carriers chosen by each caller — and given them the same distributed call center treatment.

"It's a nationwide call center with one image," said InteCom President George Platt.

"I found that Network ACD didn't give us the network control or the custom reports we wanted."

At the heart of Myall's unified call center is an InteCom E switch dubbed the Main Switching Unit (MSU). Dual T-3 circuits connect the MSU in a star configuration to six other InteCom Es, known as Survivable Switching Units (SSU), which draw processing power from the MSU while their own processors remain on standby.

When a call comes here, the MSU sends it to an interactive voice response unit to obtain information from the customer. Using InteCom's own computer-telephone link, called Open Applications Interface (OAI), the system checks with database servers to validate the customer's identity and history.

This information — along with the telephone number the customer originally dialed — identifies which application the call center agent should employ and is used to establish a session with the appropriate Windows NT-based server.

The MSU then places the call in one of over 100 call queues, based exclusively on subject matter.

"We don't queue for a particular location," Myall said. "It's irrelevant where the [agents] are located."

The validation information is encapsulated in the call record and, using OAI, the switch populates the selected agent's personal computer with the appropriate customer data and application screen.

Multiple redundancies are built into the network. For example, the MSU contains dual processors and the SSUs contain single processors that are on standby should both MSU processors or the T-3 links go down.

This kind of advanced call handling system does not come cheap, however. The cost per seat lands toward the upper end of InteCom E's $1,200 to $2,700 range, according to Platt.

But the company's decision to build its own call routing net was made primarily because AT&T's network-based virtual call center offerings didn't provide some key functions, especially the ability to handle a mix of 800 and regular calls.

Under one such plan, known as Intelligent Call Processing (ICP), the automatic call distributor at each call center continuously pours data about agent status into a routing database, which, in turn, communicates with AT&T's network control points (NCP). Each time an 800 call is placed, the network checks the NCPs to find an agent qualified and available to answer the call so the call does not have to bounce among call centers before finding a home.

Under another plan, known as Network ACD, AT&T removes all ACDs from the user's call centers and places them in AT&T central offices.

Myall considered and rejected both plans.

"I found that Network ACD didn't give us the network control or the custom reports we wanted," he said.

And ICP would have meant paying AT&T hundreds of thousands of dollars for functions such as call routing based on agent skill, which Myall has achieved on his own.

According to Myall, Microsoft can also complete calls faster over its T-3 network than by using AT&T's ICP because of the slight extra hold time built into the ICP system to consult the NCP.

Network-based schemes suffered from one other flaw that proved fatal in Microsoft's case. "They would only help me for 800 services," he said.

Collaborate

Continued from page 1

computer and PBX platforms, as well as a standard format for electronic business cards, Burton said.

The consortium is also likely to pursue further development of IsoEthernet, an extension to Ethernet that makes it possible to carve out an isochronous 64K bit/sec channel on LANs to support traffic such as voice.

And IBM reportedly has been developing a set of rules to enable its CallPath CTI link to harmonize with AT&T's Telephony Services Application Program Interface, also known as TSAPI. Developed jointly with Novell Corp., TSAPI is a key element of a client/server CTI platform known as NetWare Telephony Services that allows a user to control telephony functions from a personal computer through a link between the PBX and server.

A key area the consortium will probably address — the definition of a universal physical interface between desktop PCs and other desktop devices, including telephones — is likely to cause friction in the industry.

Apple's interface, known as Geoport, is expected to be part of the consortium's collaboration platform. But while Geoport has already drawn the support of AT&T and Rolm and is as an option on the PowerPC, it has not garnered support from PC vendors.

"Most of the PC industry looked at Geoport in some detail, and they rejected it," said Charles Fitzgerald, a Microsoft product manager in Redmond, Wash.

Instead, officials from Intel and Microsoft — reportedly excluded from the new consortium — last week told *Network World* they are close to completing their own high-speed serial link known as serial bus with the open support of Compaq Computer Corp. and tacit support of others.

The 5M bit/sec serial bus is expected to go into demonstrations in the first quarter of 1995, with shipments starting in the third quarter, said Jim Pappas, serial bus program manager for Intel in Hillsboro, Ore. Addedd Fitzgerald, "Microsoft is building support for serial bus in all future versions of Windows."

And several vendors that are not part of the consortium view the new consortium's expected favoritism toward certain existing products as hindering true standards development.

"This is not standards-oriented," said a top executive at one such vendor. "It creates more fear, uncertainty and doubt. If you're a poor independent software developer, what are you going to do? The best thing to do is not to do anything."

AT&T, IBM and Apple refused to comment. A Rolm spokesman would say only "if 75% of the market wants serial bus, we'll have to support it."

Notably missing from the new consortium is Northern Telecom, Inc. Sources said the No. 2 private branch exchange maker is concerned that it still cannot easily write a driver for TSAPI despite the release of a newly polished Version 2 of TSAPI (*NW,* Nov. 7, page 23). As a result, the company reportedly is looking for the emergence of a CTI standards organization that is not perceived to be dominated by AT&T.

BackOffice

Continued from page 6

environment promised more flexibility and growth opportunity, as well as an easier user interface. Bank South will install SMS to manage its new enterprise PC network, Schulman said.

The University of Miami in Coral Gables, Fla., is also embracing Windows NT, but is not sold on all of BackOffice's components. The university's admissions office, for example, already runs Sybase, Inc.'s SQL Server on Unix, so it is evaluating Sybase SQL Server for Windows NT rather than Microsoft's SQL Server implementation. The Sybase version differs from Microsoft SQL Server for Windows NT but is more like Sybase's other products.

It might be cheaper to use Microsoft SQL Server because it comes in BackOffice, and the university wants to use the Windows NT and the Exchange Server components, said Byron Jones, microsystems manager at the school. "But you have to consider compatibility and ease of use," he added.

Similarly, the university is warily considering SMS; it already uses Cabletron Systems, Inc.'s Spectrum, and net managers don't want to switch just so they can use another component of BackOffice. "Even with the tools they bundled in, even if the software is free, it's another standard to support," Jones said. "Maintenance is expensive."

But users generally said BackOffice offers advantages by providing a complete solution.

BackOffice provides all of the pieces MCI Consumer Markets in Austin, Texas, needs for its new enterprise installation, which involves 7,000 users at 20 sites around the country, said Wood Hargis, corporate net developer.

"Windows NT is really made for an enterprisewide PC network," Hargis said.

SQL Server will replace the current Digital Equipment Corp. VAX-based database, SMS will provide network management, and the operating system itself will support a variety of network protocols. MCI will keep its mainframe and access the legacy data via Microsoft's SNA Server, a BackOffice component. Hargis plans to replace MCI Mail boxes with Exchange Server, which will become part of BackOffice as soon as it ships.

Windows NT's "distributed computing philosophy brought us in, and it's a nice blanket network solution," Hargis said.

"The main impetus was the client/server architecture," he said. "We believe that is the wave of the future, and the biggest client/server development platform we could find was Windows NT."

Gibbs

Continued from page 30

Department of Environment, Health and Natural Resources. From his fevered mind comes the following: "Theory No. 3: Token Ring is actually Ethernet.

"IBM refused to believe that anything researched and developed outside the Thomas Watson labs could actually work.

"When they found this wasn't true, they sent agents to break into the University of Hawaii labs and copy the complete AlohaNet notes. They then created Token Ring, which actually is Ethernet with a complex series of software drivers that make it look like something different. The Tropic chipset was created to perpetuate this deception in hardware, also allowing IBM to charge five times as much for Ethernet as everyone else."

For good measure, Bank also pitched: "Theory No. 4: ATM is actually Ethernet.

"IBM refused to believe that anything researched and developed inside the Thomas Watson labs could fail to work. When they found this wasn't true, they created Asynchronous Transfer Mode, which actually is Ethernet with a complex series of software drivers that make it look like something different.

"The ATM Forum was created to perpetuate this deception, which will allow IBM to charge lots more for the same old Ethernet."

Belgarath the Sorcerer will be receiving the first prize and a referral to a medical practitioner who understands his kind of problems.

Thank you all.

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NETWORK WORLD

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Warehouses

Continued from page 1

Sybase this week will announce a version of its database primed for building data warehouses.

The data warehouse offering, slated to roll out in mid-1995, will build on the company's SQL Server System 10 database.

It will also include gateways to several mainframe databases, plus query accelerating technology obtained via the acquisition of Expressway Technology, Inc. last month, sources familiar with the product said.

Sybase is expected to complement the new offering by reselling Prism Solutions, Inc.'s Prism Warehouse Manager, a tool for extracting data from several sources into a data warehouse.

Prism has a new data warehouse tool of its own on the way (see story, this page).

Pricing information on the Sybase data warehouse offering was not available, and Sybase officials declined to comment on the announcement in general.

Sybase rival Informix is expected to announce its own data warehouse in the next few months.

Few details were available, but sources said the offering would consist of the Informix On-Line database, mainframe gateways the company is developing with Information Builders, Inc., and Prism's Warehouse Manager.

Informix officials could not be reached for comment.

WHAT ABOUT ORACLE?

Oracle Corp., too, is making a push in the data warehousing niche, according to Neil Mendelson, senior director of scalable parallel systems at Oracle.

"We haven't stood atop of 500 Oracle Parkway and blasted off rockets saying we're doing data warehousing, but our customers are using Oracle for that purpose," he said.

Mendelson said Oracle is not prepping a niche product for data warehousing. Instead, the company has alliances with several mainframe hardware vendors, including Amdahl Corp., AT&T GIS and Unisys Corp., that have announced or shipped data warehouses based on the Oracle database.

Oracle will continue to forge alliances with hardware and software vendors that offer data warehousing products, Mendelson said. ☒

Warehouse awareness

Informix and Sybase separately are readying client/server data warehouse products. The offerings are expected to be based on the firms' core databases but also include gateways and other technology.

Newbridge

Continued from page 8

switches offered by vendors such as Agile Networks, Inc., Allied Telesyn, Inc. and Kalpana, Inc.

The LSU could be collocated with a 36150, serving as a fan-out device, or it could be deployed remotely as a feeder.

Pricing has not yet been determined, although Ali said the LSU should prove more price competitive than other vendor offerings, which range from $500 to $1,000 per port.

ABR SUPPORT AND MORE

Newbridge is also adding support for new ATM classes of service currently being finalized by the ATM Forum.

As the forum completes a rate-based congestion control scheme for the pending available bit rate (ABR) class of service, Newbridge, like most vendors, faces software and hardware upgrade requirements.

Users will have to replace their switch control cards if they want to implement ABR on their installed 36150s. A separate buffer upgrade may not require new switch modules, Ali said, as software enhancements to Newbridge's buffer management algorithms, due in June, could satisfy the new requirements without additional memory.

As the 36150 is tweaked, Newbridge's larger, second-generation backbone ATM switch — the 36170 — will enter field trials with two to four carriers in January and production shipments around March 1995.

The 36170 will ship with full Simple Network Management Protocol support, and SNMP support will also be added to the 36150 in March.

Until now, the switch supported only Newbridge's proprietary management agents.

Analysts who were familiar with most of these plans but had not been briefed about the LSU said Newbridge may have taken the right tack by going it alone in its Ethernet switch development, rather than partnering for the technology as so many of its competitors have.

"There's a mood developing that says a partnership isn't worth doing if the result isn't equivalent to what you could develop in-house," said Stan Hanks, a consultant with Technology Transfer Associates, Inc. of Houston.

"This sort of tightly integrated device that meshes with their management system and back ends off their ATM switch plays well into their enterprise connectivity story," Hanks said.

ⒸNewbridge: (703) 834-3600.

> **"There's a mood developing that says a partnership isn't worth doing if the result isn't equivalent to what you could develop in-house."**

Prism readies data warehouse tool

Prism Solutions, Inc. this week will roll out client/server software that lets administrators better catalog information stored in data warehouses, resulting in more efficient end-user queries.

Data warehouses contain static information that has been compiled elsewhere, whereas traditional databases house ever-changing information that is updated by a transaction processing system. End users access the warehouse information with decision support tools.

The new Prism Directory Manager product lets administrators build data warehouse directories that contain meta data, descriptions of where data is located and the history behind that data. End users browse meta data to determine the kinds of queries they can make.

Administrators may also customize the views of this meta data, delivering the information in traditional business terms or simple English, said Jim Ashbrook, president of Prism.

Prism Directory Manager, which works with the company's Prism Warehouse Manager data extraction tool, has three components:

- **The server-based Directory Builder gathers and integrates meta data from a variety of sources into a single directory and lets administrators build customized views of the meta data.**
- **The Information Directory, which also resides on the server, stores information about the data warehouse in simple terms.**
- **The client-based Directory Navigator lets end users access meta data stored in the information directory.**

The server software may reside on the same machine as the data warehouse or on a different machine. "They're moving toward the next level of data warehousing, which is to give people a central place to store and browse meta data," said Barry Wilderman, an analyst at META Group, Inc.

Prism Directory Manager, which will be available in the first quarter of 1995, will support Windows clients and several Unix servers. It costs $50,000 for five Directory Builder seats and 26 Navigator seats.

Prism: (408) 481-0240.

BY BARB COLE

Reality ☑ Check

Product: Prism Directory Manager
Company: Prism

The benefits:
- Lets administrators and end users browse through meta data for more efficient queries.
- Can export meta data into several front-end data access tools; can store data in several leading databases.

The drawbacks:
- Requires Prism Warehouse Manager.
- Directory Manager is not automatically updated when data warehouse information changes.

The user view:

“Right now, we either have to generate our own SQL statements or construct a separate application to view our meta data. With the Directory Manager, we can integrate the searching of meta data with our warehouse application.”

Marcia Rhode, senior data administrator, Lower Colorado River Authority

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Back to Reality

Rolling Stones try to give Internet satisfaction; MCI goes for the 'Net.

BY DAVID J. BUERGER

"I can't get no, sa-tis-fac-tion.
I can't get no, sa-tis-fac-tion.
'Cause I tried. And I tried. And I tried. And I tried.
I can't get no! I can't get no! Sa-tis-fac-tion!"

— Mick Jagger

My boss, John Gallant, likes to start his columns with a quote from Shakespeare. I never caught on to William's beat, but Mick made a lot of sense when I was a teenager — and still does today. Of course, I'd never admit that in print, especially an august publication such as *Network World.*

These days, the Rolling Stones are more than hip — they're on the Internet. The Stones made their cyberspace debut just over a week ago with a live 20-minute concert broadcast from the Cotton Bowl in Dallas.

While the cyber-concert was free, the gear required to view it was not. Only about 200 computer sites logged on via the Internet's M-Bone, which is used for experimental audio/video feeds. That equipment costs up to 20 grand per viewer, which makes a $300 Stones concert ticket look like a yard-sale bargain.

The price tag might shock you, but the cyber-broadcast quality should not: It was awful!

The inch-and-a-half square, slow-speed video image had a hard time trailing Mick's gyrations. The choppy audio had a harder time tracking "Not Fade Away" and other familiar tunes.

It reminds me of when I was a kid, hunched over a static-filled AM radio trying to hear Harry Caray call St. Louis Cardinal's games. Half the time, we wondered what had happened.

The lesson is that both Mick Jagger and users *still* can't get no satisfaction when it comes to real-world multimedia over the information superhighway. It's also a reminder that network-based multimedia is more a promise than reality.

Pile on the hype

An American rock music entrepreneur, Neil Bogart, once said, "If you hype something and it succeeds, you're a genius — it wasn't a hype. If you hype it and it fails, then it was just a hype."

More than one would-be genius is praying that the superhighway thing doesn't turn out to be a horse path to nowhere.

A report last week that television-based home shopping purchases are dropping off is a precursor of rocky times ahead for superhighway promoters. From a financial perspective, it's pretty scary when the sizzle won't sell the steak — especially before the infrastructure is built.

This doubt hasn't scared off MCI, though, which last week unveiled a plan to offer Internet access and shopping services for businesses and consumers.

MCI Communications Corp. has partnered with Netscape Communications, Inc. for the interface software and RSA Data Security, Inc. for encryption to protect financial transactions over the Internet.

The entry of a big, experienced player like MCI is welcome news to us Internauts. Some of the biggest hassles in dealing with the net are questionable connections and hard-to-use and/or flaky software.

My own New York-based supplier, The Pipeline, is a case in point. As is typical of most small suppliers, its staff is enthusiastic but hard to reach. Pipeline's host computer is unavailable several times a week. Sometimes when traveling, I find that Sprint's access network is more reliable than Pipeline's host.

Pipeline's software has an attractive interface, ranked No. 1 by *PC Magazine* last summer. But the software is unreliable. For example, I have to reboot my Compaq computer after every communications session or the computer crashes and reboots itself.

I'm willing to use the software only because of other trade-offs. But that's an attitude that won't replicate well throughout mainstream business and consumer users.

In addition to competition from a zillion small and a few large suppliers, MCI has another thorny challenge to solve: how to convince Internauts that @mci-mail.com is a cool E-mail address. Guess we'll see how MCI's marketeers handle this one.

Meanwhile, the kids in Provo, Utah, are also planning superhighway browser software for NetWare — except it's based on TCP/IP, not IPX. Novell has been talking about its Universal Client — software that connects to any service or network — for well over a year. Funny how each innovation further weakens the need for good ol' NetWare. Looks like the real long-term battle will be Unix vs. Windows NT.

Pending link

Private network managers reading this column may be thinking, I'm glad I don't have to deal with this stuff!

Allow me to spoil your day: you will.

The push to do business over the Internet means that within five years, network managers will spend over half their time solving connectivity problems for users in *other* businesses.

You may be irritated today when users call to complain that their E-mail isn't working. Just wait until an outside customer calls and doesn't know what a mouse is.

See — Mick's refrain *is* eternal!

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CyberSpeak

Voices from the reader network

How does your company plan to do business over the Internet?

◆ "We're going the interactive cable television route. For now, I can't anticipate any hotel applications that would work in an on-line scenario, such as the Internet."

Douglas Holloway, vice president of technical services, Prime Hospitality Corp., Fairfield, N.J.

◆ "My company runs a computer-moderated fantasy game over the 'Net. The 'Play by Mail' industry has been around since the 1970s. Players mail their orders to a central moderator, who collects the orders from all of the other players, then sends out reports detailing what took place in the game world. Rather than dealing with data-entry and envelope stuffing, our game is run 100% by E-mail. We started in June and currently have about 200 customers. Each customer pays $2.50 per week to participate. The full rules kit can be had by writing to info@pbm.com, or you can pick it up via file transfer protocol from pbm.com in pub/olympia."

Rich Skrenta, Shadow Island Games, Somerset, N.J.

◆ "With every company in the world staggering on-line in one form or another, we are now exploring a variety of ways to use the Internet for our business. The first method we'll use is a World-Wide Web site, explaining the products that WSS produces, as well as offering pricing information and the like. Later on, we'll probably expand our Web capabilities to allow on-line ordering of products."

Jon Rickner, assistant senior programmer, WWIV Software Services, St. Louis

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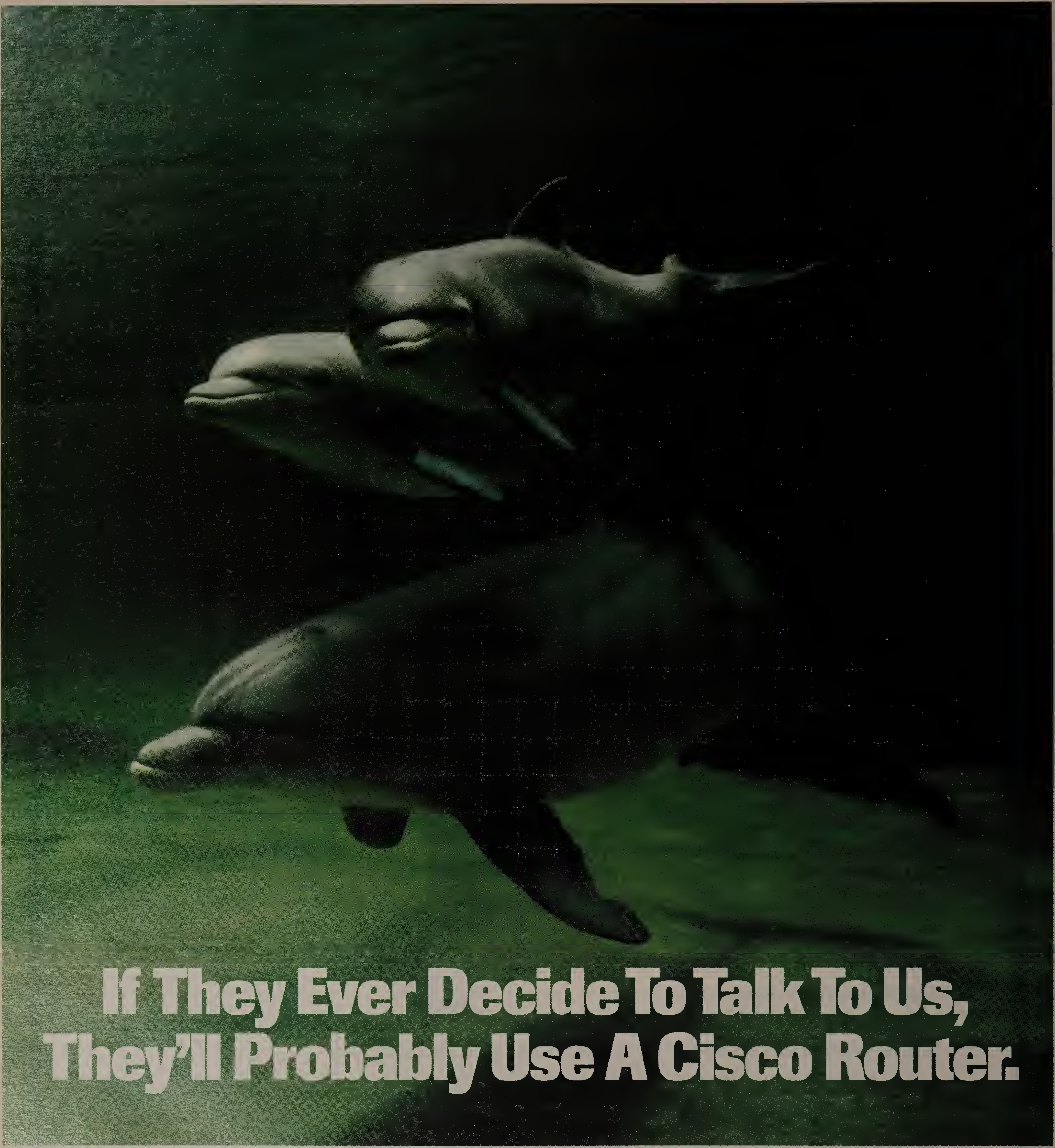
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